Contemporary Business Mathematics (Canadian) 11th edition Hummelbrunner Test Bank

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Contemporary Business Math w/ Canadian Apps., 11e **(Hummelbrunner/Coombs)**
Chapter 2 Review of Basic Algebra

1) Simplify: $7m - 2m - 3m$
Answer: $2m$
Diff: 1 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

2) Simplify: $4x - 3y - 4x - 2y$
Answer: $-5y$
Diff: 1 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

3) Simplify: $4x - 6y - 4x - 2y$
Answer: $-8y$
Diff: 1 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

4) Simplify: $x + 0.16x$
Answer: $1.16x$
Diff: 1 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

5) Simplify: $x - 0.32x$
Answer: $0.68x$
Diff: 1 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

6) Simplify: $x - 0.62x$
Answer: $0.38x$
Diff: 1 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
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7) Simplify: $3ax - 4x + 1 - 7 + 3x - 4ax$
Answer: $-ax - x - 6$
Diff: 1 Type: SA Page Ref: 44-49
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8) Simplify: $-(4 - 6a) - (-4 + 3a)$
Answer: $-4 + 6a + 4 - 3a = 3a$
Diff: 2 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

9) Simplify: $-(4 - 6a) - (-8 + 6a)$
Answer: $-4 + 6a + 8 - 6a = 4$
Diff: 2 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

10) Simplify: $-(3m - 6m - 5) - (4 - 7m - 2m)$
Answer: $-3m + 6m + 5 - 4 + 7m + 2m = 12m + 1$
Diff: 2 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

11) Simplify: $(7a - 7b) - (-3a + 9b) - 11b$
Answer: $7a - 7b + 3a - 9b - 11b = 10a - 27b$
Diff: 2 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

12) Simplify: $(8a - 7b) - (-3a + 7b) - 11b$
Answer: $8a - 7b + 3a - 7b - 11b = 11a - 25b$
Diff: 2 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

13) Simplify: $-7(9a)$
Answer: $-63a$
Diff: 1 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

14) Simplify: $-9a(-5b)$
Answer: $45ab$
Diff: 1 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
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15) Simplify: $-5a(-5b)$
Answer: $25ab$
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16) Simplify: $-6m(-3m)$
Answer: $18m^2$
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Topic: 2.1 Simplification of Algebraic Expressions
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17) Simplify: $3a(-3b)(-4c)(-1)$
Answer: $-36abc$
Diff: 1 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

18) Simplify: $-2a(-3b)(-4c)(-5)$
Answer: $120abc$
Diff: 1 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

19) Simplify: $5(4x - 2)$
Answer: $20x - 10$
Diff: 2 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

20) Simplify: $-3x(4 - 2b - b)$
Answer: $-12x + 6bx + 3bx = -12x + 9bx$
Diff: 2 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

21) Simplify: $-3x(4 - 2b - 2b)$
Answer: $-12x + 6bx + 6bx = -12x + 12bx$
Diff: 2 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

22) Simplify: $-5(8a - b) - 2(-6a + 9b)$
Answer: $-40a + 5b + 12a - 18b = -28a - 13b$
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23) Simplify: $8(9y - 4) - 2(y - 1) - (1 - 3y)$
Answer: $72y - 32 - 2y + 2 - 1 + 3y = 73y - 31$
Diff: 2 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

24) Simplify: $4(9y - 4) - 2(y - 1) - (1 - 3y)$
Answer: $36y - 16 - 2y + 2 - 1 + 3y = 37y - 15$
Diff: 2 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

25) Simplify: $(5m - 2n)(m - 12n)$
Answer: $5m^2 - 60mn - 2mn + 24n^2 = 5m^2 - 62mn + 24n^2$
Diff: 2 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

26) Simplify: $(3a - 1)(a - 3a + 1)$
Answer: $3a^2 - 9a^2 + 3a - a + 3a - 1 = -6a^2 + 5a - 1$
Diff: 2 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

27) Simplify: $(4a - 1)(a - 3a + 1)$
Answer: $4a^2 - 12a^2 + 4a - a + 3a - 1 = -8a^2 + 6a - 1$
Diff: 2 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

28) Simplify: $2(a - 1)(7a - 3) - 3(6a - 2)(2a + 1)$
Answer: $2(7a^2 - 3a - 7a + 3) - 3(12a^2 + 6a - 4a - 2)$
$= 14a^2 - 6a - 14a + 6 - 36a^2 - 18a + 12a + 6$
$= -22a^2 - 26a + 12$
Diff: 2 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

29) Simplify: $50xy \div (-5x)$
Answer: $-10y$
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Topic: 2.1 Simplification of Algebraic Expressions
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30) Simplify: $60xy \div (-5xy)$
Answer: -12
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Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

31) Simplify: $(-45a^3b) \div 15a^2$
Answer: $-3ab$
Diff: 1 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

32) Simplify: $(-64ab) \div (8ab)$
Answer: -8
Diff: 1 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

33) Simplify: $(-8ab) \div (8a)$
Answer: -b
Diff: 1 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

34) Simplify: $(21x - 36) \div (-3)$
Answer: $-7x + 12$
Diff: 2 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

35) Simplify: $(-a^3 - 11a^2 - 3a) \div (-a)$
Answer: $a^2 + 11a + 3$
Diff: 2 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

36) Simplify: $(-a^3 - 10a^2 - 3a) \div (a)$
Answer: $-a^2 - 10a - 3$
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37) Evaluate: $4x^2 - 10xy - 8y^2$ for $x = -3$, $y = 5$
Answer: $4x^2 - 10xy - 8y^2$
$= 4(-3)^2 - 10(-3)(5) - 8(5)^2$
$= 4(9) + 150 - 8(25)$
$= 36 + 150 - 200$
$= -14$
Diff: 2 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

38) Evaluate y: $y = \frac{1}{2}(3x^2 - x - 1) - \frac{1}{4}(5 - 2x - x^2)$ for $x = -3$

Answer: $\frac{1}{2}(3x^2 - x - 1) - \frac{1}{4}(5 - 2x - x^2)$

$= \frac{1}{2}[3(-3)^2 - (-3) - 1] - \frac{1}{4}[5 - 2(-3) - (-3)^2]$

$= \frac{1}{2}(27 + 3 - 1) - \frac{1}{4}(5 + 6 - 9)$

$= \frac{1}{2}(29) - \frac{1}{4}(2)$

$= 14.5 - 0.5$
$= 14.0$
Diff: 2 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

39) Evaluate R: $R = \frac{I}{PT}$ for I = 83, P = 845, $T = \frac{216}{360}$

Answer: $\frac{I}{PT} = \frac{83}{845 * \frac{216}{360}} = \frac{83}{845 * 6} = \frac{83}{507} = .163708$

Diff: 3 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

40) Evaluate r: $r = \frac{I}{PT}$, where I = 116, P = 1760, $t = \frac{150}{365}$

Answer: $r = \frac{116}{1760 * \frac{160}{365}} = \frac{116}{1760 * .4109589} = \frac{116}{723.28767} = .1603788$

Diff: 3 Type: SA Page Ref: 44-49
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41) Evaluate r: $r = \frac{I}{PT}$, where I = 200, P = 800, $t = \frac{150}{365}$

Answer: $r = \frac{200}{800 * \frac{160}{365}} = \frac{200}{800 * .4109589} = \frac{200}{32876712} = .6083333$

Diff: 3 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

42) Evaluate K: $K = \frac{2NC}{P(n+1)}$ for N = 32, C = 20, P = 1859, $n = 26$

Answer: $\frac{2NC}{P(n+1)} = \frac{2 * 32 * 20}{1859(26+1)} = \frac{1280}{1859(27)} = \frac{1280}{50193} = .0255$

Diff: 3 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

43) Evaluate P: P = A(1 - RT) for A = 1400, R = 0.185, $T = \frac{252}{360}$

Answer: $A(1 - RT) = 1400\left[1 - 0.185 * \frac{252}{360}\right] = 1400\ [1 - .185 * 7]$

$= 1400[1 - .1295] = 1400[.8705] = 1218.7$

Diff: 2 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

44) Evaluate P: P = A(1 - RT) for A = 700, R = 0.185, $T = \frac{180}{360}$

Answer: $A(1 - RT) = 700\left[1 - 0.185 * \frac{180}{360}\right] = 1400\ [1 - .185 * 7]$

$= 700[1 - .0925] = 700[.9075] = 635.25$

Diff: 2 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

45) Evaluate p: $p = s\left[1 - r * \frac{t}{360}\right]$, where $s = 3120$, $r = 0.123$, $t = 295$

Answer: $p = 3120\left[1 - .123\left(\frac{295}{360}\right)\right] = 3120[1 - .123 * .8194444]$

$= 3120[1 - .1007917] = 3120[.8992083] = 2805.53$

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46) Evaluate P: $P = \frac{A}{1 + RT}$ for A = 752, R = 0.145, $T = \frac{225}{360}$

Answer: $\frac{A}{1 + RT} = \frac{752}{1 + .145 * .625} = \frac{752}{1 + .090625} = \frac{752}{1.090625} = 689.5129$

Diff: 3 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

47) Evaluate s: $s = \frac{p}{\left(1 + r * \frac{t}{360}\right)}$, where $p = 3411.50$, $r = 0.0925$, $t = 75$

Answer: $s = \frac{3411.50}{1 + .0925 * .0208333} = \frac{3411.50}{1 + .00192708} = \frac{3411.50}{1.0192708} = 3347.001$

Diff: 3 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

48) Evaluate the value of FV, if $FV = PMT\left[\frac{(1 + i)^n - 1}{i}\right]$, PMT = \$750, i = 0.025, and n = 10.

Answer: $FV = 750\left[\frac{(1 + 0.025)^{10} - 1}{0.025}\right] = \$8402.54$

Diff: 3 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

49) Evaluate: 1^6
Answer: 1
Diff: 1 Type: SA Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

50) Evaluate: $(-1)^{14}$
Answer: 1
Diff: 1 Type: SA Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

51) Evaluate: $(-1)^{13}$
Answer: -1
Diff: 1 Type: SA Page Ref: 51-58
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52) Evaluate: $\left[\frac{-1}{8}\right]^5$

Answer: $-\frac{1}{32768}$

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Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

53) Evaluate: $(-0.1)^7$
Answer: -0.0000001
Diff: 1 Type: SA Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

54) Evaluate: $(-0.1)^4$
Answer: 0.0001
Diff: 1 Type: SA Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

55) Evaluate: m^0
Answer: 1
Diff: 1 Type: SA Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

56) Evaluate: $(-5)^{-2}$
Answer: $\frac{1}{25}$ or .04

Diff: 2 Type: SA Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

57) Evaluate: $(-5)^{-3}$
Answer: $-\frac{1}{125}$ or -.008

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58) Evaluate: $\left[\frac{2}{3}\right]^{-3}$

Answer: $\frac{27}{8}$ or 3.375

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Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

59) Evaluate: $(1.05)^0$
Answer: 1
Diff: 1 Type: SA Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

60) Evaluate: $-(288888)^0$
Answer: -1
Diff: 1 Type: SA Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

61) Evaluate: $(3)^2(3)^4$
Answer: $(3)^2(3)^4 = 3^6 = 729$
Diff: 2 Type: SA Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

62) Simplify: $(-4)^4 * (-4)$
Answer: $(-4)^{4+1} = (-4)^5 = -1024$
Diff: 2 Type: SA Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

63) Simplify: $(-4)^3 * (-4)$
Answer: $(-4)^{3+1} = (-4)^4 = 256$
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64) Simplify: $(-3)^7 \div (-3)^4$
Answer: $(-3)^{7-4} = (-3)^3 = -27$
Diff: 2 Type: SA Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

65) Simplify: $(m^4)^5$
Answer: $(m^4)^5 = m^{4 \times 5} = m^{20}$
Diff: 1 Type: SA Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

66) Simplify: $(m^5)^5$
Answer: $(m^5)^5 = m^{5 \times 5} = m^{25}$
Diff: 1 Type: SA Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

67) Simplify: $[(-4)^4]^3$
Answer: $(-4)^{4 \times 3} = (-4)^{12} = 16777216$
Diff: 2 Type: SA Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

68) Simplify: $m^{13} \div m^6$
Answer: $m^{13-6} = m^7$
Diff: 1 Type: SA Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

69) Simplify: $(-1)^4(-1)^2(-1)^5$
Answer: $(-1)^{4 + 2 + 5} = (-1)^{11} = -1$
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70) Simplify: $\frac{(x^3)(x^5)}{x^4}$

Answer: $x^{3 + 5 - 4} = x^4$
Diff: 2 Type: SA Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

71) Simplify: $\frac{(x^{16})(x^4)}{x^2}$

Answer: $x^{16 + 4 - 2} = x^{18}$
Diff: 2 Type: SA Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

72) Simplify: $\left[\frac{1}{9}\right]^8 \div \left[\frac{1}{9}\right]^3$

Answer: $[1/9]^{8-3} = [1/9]^5 = 1/59049$
Diff: 2 Type: SA Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

73) Simplify: $\left[\frac{-3}{5}\right]^9 \div \left[\frac{-3}{5}\right]^4$

Answer: $[-3/5]^{9 - 4} = [-3/5]^5 = -243/3125 = -.07776$
Diff: 2 Type: SA Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

74) Simplify: $1.005^{240} \div 1.005^{160}$

Answer: $1.005^{240 -160} = 1.005^{80} = 1.4903386$
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75) Simplify: $\left[\left(\frac{-3}{8}\right)^6\right]^3$

Answer: $[-3/8]^{6 \times 3} = [-3/8]^{18} = (-3)^{18}/8^{18}$ or .0000000215062

Diff: 2 Type: SA Page Ref: 51-58

Topic: 2.2 Integral Exponents

Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

76) Simplify: $(1 - r)^2(1 - r)^3(1 - r)$

Answer: $(1 - r)^6$

Diff: 2 Type: SA Page Ref: 51-58

Topic: 2.2 Integral Exponents

Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

77) Simplify: $(1 - r)^3(1 - r)^4(1 - r)$

Answer: $(1 - r)^8$

Diff: 2 Type: SA Page Ref: 51-58

Topic: 2.2 Integral Exponents

Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

78) Simplify: $[(1 - r)^{51}]^2$

Answer: $(1 - r)^{51 \times 2} = (1 - r)^{102}$

Diff: 2 Type: SA Page Ref: 51-58

Topic: 2.2 Integral Exponents

Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

79) Simplify: $(2xy)^5$

Answer: $2^5x^5y^5 = 32x^5y^5$

Diff: 2 Type: SA Page Ref: 51-58

Topic: 2.2 Integral Exponents

Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

80) Simplify: $\left[\frac{a^5b^6}{x}\right]^3$

Answer: $\frac{a^{5 \times 3}\, b^{6 \times 3}}{x^{1 \times 3}} = \frac{a^{15}\, b^{18}}{x^3}$

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Topic: 2.2 Integral Exponents

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81) Simplify: $\left[\frac{a^6 b^8}{x}\right]^2$

Answer: $\frac{a^{6 \times 2} b^{8 \times 2}}{x^{1 \times 2}} = \frac{a^{12} b^{16}}{x^2}$

Diff: 2 Type: SA Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

82) Simplify: $5^7 \div 5^{-3}$

Answer: $5^{7 - (-3)} = 5^{10}$

Diff: 3 Type: SA Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

83) Simplify: $\left[\frac{1 + i}{i}\right]^n$

Answer: $\frac{(1 + i)^n}{i^n}$

Diff: 3 Type: SA Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

84) Compute: $\sqrt{205.9225}$

Answer: $\sqrt{205.9225} = 14.35$

Diff: 1 Type: SA Page Ref: 59-62
Topic: 2.3 Fractional Exponents
Objective: 2-3: Use an electronic calculator to compute the numerical value of arithmetic expressions involving fractional exponents.

85) Compute: $\sqrt[12]{1.126825}$

Answer: 1.01

Diff: 2 Type: SA Page Ref: 59-62
Topic: 2.3 Fractional Exponents
Objective: 2-3: Use an electronic calculator to compute the numerical value of arithmetic expressions involving fractional exponents.

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86) Compute: $\sqrt[3]{1.092727}$
Answer: 1.03
Diff: 2 Type: SA Page Ref: 59-62
Topic: 2.3 Fractional Exponents
Objective: 2-3: Use an electronic calculator to compute the numerical value of arithmetic expressions involving fractional exponents.

87) Compute: $\sqrt[11]{.000488281}$
Answer: .5
Diff: 2 Type: SA Page Ref: 59-62
Topic: 2.3 Fractional Exponents
Objective: 2-3: Use an electronic calculator to compute the numerical value of arithmetic expressions involving fractional exponents.

88) Compute: $\sqrt[14]{1.159}$
Answer: 1.010595566
Diff: 2 Type: SA Page Ref: 59-62
Topic: 2.3 Fractional Exponents
Objective: 2-3: Use an electronic calculator to compute the numerical value of arithmetic expressions involving fractional exponents.

89) Compute: $\sqrt[6]{1.418519112}$
Answer: 1.06
Diff: 2 Type: SA Page Ref: 59-62
Topic: 2.3 Fractional Exponents
Objective: 2-3: Use an electronic calculator to compute the numerical value of arithmetic expressions involving fractional exponents.

90) Compute: $1956^{2/5}$
Answer: 20.727529
Diff: 2 Type: SA Page Ref: 59-62
Topic: 2.3 Fractional Exponents
Objective: 2-3: Use an electronic calculator to compute the numerical value of arithmetic expressions involving fractional exponents.

91) Compute: $32.5^{3/4}$
Answer: 13.611705
Diff: 2 Type: SA Page Ref: 59-62
Topic: 2.3 Fractional Exponents
Objective: 2-3: Use an electronic calculator to compute the numerical value of arithmetic expressions involving fractional exponents.

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92) Compute: $32^{3/4}$
Answer: 13.45434264
Diff: 2 Type: SA Page Ref: 59-62
Topic: 2.3 Fractional Exponents
Objective: 2-3: Use an electronic calculator to compute the numerical value of arithmetic expressions involving fractional exponents.

93) Compute: $\sqrt[7]{4.5689}$
Answer: 1.2423925
Diff: 2 Type: SA Page Ref: 59-62
Topic: 2.3 Fractional Exponents
Objective: 2-3: Use an electronic calculator to compute the numerical value of arithmetic expressions involving fractional exponents.

94) Compute: $1.28^{-5/14}$
Answer: .9156104
Diff: 3 Type: SA Page Ref: 59-62
Topic: 2.3 Fractional Exponents
Objective: 2-3: Use an electronic calculator to compute the numerical value of arithmetic expressions involving fractional exponents.

95) Compute: $\frac{1 - 1.15^{-41}}{0.05}$
Answer: $\frac{1 - .0032463}{.05} = \frac{.9967537}{.05} = 19.935074$
Diff: 3 Type: SA Page Ref: 59-62
Topic: 2.3 Fractional Exponents
Objective: 2-3: Use an electronic calculator to compute the numerical value of arithmetic expressions involving fractional exponents.

96) Compute the value of $\frac{1 - 1.025^{-25}}{0.0295}$
Answer: $\frac{1 - .5393906}{.0295} = \frac{.4606094}{.0295} = 15.61388$
Diff: 3 Type: SA Page Ref: 59-62
Topic: 2.3 Fractional Exponents
Objective: 2-3: Use an electronic calculator to compute the numerical value of arithmetic expressions involving fractional exponents.

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97) Compute the value of $\frac{1 - 1.02^{-10}}{0.02}$

Answer: $\frac{1 - .8203482999}{.02} = \frac{.1796517001}{.02} = 8.982585006$

Diff: 3 Type: SA Page Ref: 59-62
Topic: 2.3 Fractional Exponents
Objective: 2-3: Use an electronic calculator to compute the numerical value of arithmetic expressions involving fractional exponents.

98) Evaluate: $50.00\left[\frac{(1 + .02)^{40} - 1}{0.02}\right]$

Answer: $50.00\left[\frac{(1 + .02)^{40} - 1}{0.02}\right]$

$= 50\left[\frac{(1.02)^{40} - 1}{0.02}\right]$

$= 50\left[\frac{2.208039664 - 1}{0.02}\right]$

$= 50\left[\frac{1.208039664}{0.02}\right]$

$= 50(60.40198318)$

$= 3020.10$

Diff: 2 Type: SA Page Ref: 59-62
Topic: 2.3 Fractional Exponents
Objective: 2-3: Use an electronic calculator to compute the numerical value of arithmetic expressions involving fractional exponents.

99) Express in logarithmic form: $3^9 = 19683$
Answer: $9 = \log_3 19683$
Diff: 2 Type: SA Page Ref: 63-69
Topic: 2.4 Logarithms - Basic Aspects
Objective: 2-4: Write exponential equations in logarithmic form and use an electronic calculator equipped with a natural logarithm function to determine the value of natural logarithms.

100) Express in logarithmic form: $5^6 = 19683$
Answer: $6 = \log_5 15625$
Diff: 2 Type: SA Page Ref: 63-69
Topic: 2.4 Logarithms - Basic Aspects
Objective: 2-4: Write exponential equations in logarithmic form and use an electronic calculator equipped with a natural logarithm function to determine the value of natural logarithms.

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101) Express in logarithmic form: $10^{-4} = 0.0001$
Answer: $\log_{10} .0001 = -4$
Diff: 2 Type: SA Page Ref: 63-69
Topic: 2.4 Logarithms - Basic Aspects
Objective: 2-4: Write exponential equations in logarithmic form and use an electronic calculator equipped with a natural logarithm function to determine the value of natural logarithms.

102) Express in logarithmic form: $e^{-3x} = 12$
Answer: $e^{-3x} = 12$, $-3x = \log_e 12$, or $\ln 12 = -3x$
Diff: 2 Type: SA Page Ref: 63-69
Topic: 2.4 Logarithms - Basic Aspects
Objective: 2-4: Write exponential equations in logarithmic form and use an electronic calculator equipped with a natural logarithm function to determine the value of natural logarithms.

103) Express in exponential form: $\log_3 \frac{1}{81} = -4$

Answer: $\log_3 \frac{1}{81} = -4$, $3^{-4} = \frac{1}{81}$

Diff: 2 Type: SA Page Ref: 63-69
Topic: 2.4 Logarithms - Basic Aspects
Objective: 2-4: Write exponential equations in logarithmic form and use an electronic calculator equipped with a natural logarithm function to determine the value of natural logarithms.

104) Express in exponential form: $\log_{10} \frac{1}{100} = -2$

Answer: $\log_{10} \frac{1}{100} = -2$, $10^{-2} = \frac{1}{100}$

Diff: 2 Type: SA Page Ref: 63-69
Topic: 2.4 Logarithms - Basic Aspects
Objective: 2-4: Write exponential equations in logarithmic form and use an electronic calculator equipped with a natural logarithm function to determine the value of natural logarithms.

105) Express in exponential form: $\ln e^5 = 5$
Answer: $e^5 = e^5$
Diff: 2 Type: SA Page Ref: 63-69
Topic: 2.4 Logarithms - Basic Aspects
Objective: 2-4: Write exponential equations in logarithmic form and use an electronic calculator equipped with a natural logarithm function to determine the value of natural logarithms.

106) Evaluate: ln 300
Answer: ln 300 = 5.703782
Diff: 2 Type: SA Page Ref: 63-69
Topic: 2.4 Logarithms - Basic Aspects
Objective: 2-4: Write exponential equations in logarithmic form and use an electronic calculator equipped with a natural logarithm function to determine the value of natural logarithms.

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107) Evaluate: ln 60
Answer: ln 60 = 4.094344562
Diff: 2 Type: SA Page Ref: 63-69
Topic: 2.4 Logarithms - Basic Aspects
Objective: 2-4: Write exponential equations in logarithmic form and use an electronic calculator equipped with a natural logarithm function to determine the value of natural logarithms.

108) Evaluate: $\ln[400(1.17^7)]$
Answer: $\ln[400(1.17^7)] = \ln 400 + \ln 1.17^7$
$= \ln 400 + 7(\ln 1.17)$
$= 5.9914645 + 7(.1570038)$
$= 5.9914645 + 1.0990262 = 7.090491$
Diff: 2 Type: SA Page Ref: 63-69
Topic: 2.4 Logarithms - Basic Aspects
Objective: 2-4: Write exponential equations in logarithmic form and use an electronic calculator equipped with a natural logarithm function to determine the value of natural logarithms.

109) $\ln\left[\dfrac{1-(1+0.0625)^{-12}}{0.0625}\right]$
Answer: $\ln\left[\dfrac{1-(1+0.0625)^{-12}}{0.0625}\right]$
$= \ln\left[\dfrac{1-0.0625^{-12}}{0.0625}\right]$
$= \ln\left[\dfrac{1-0.483117462}{0.0625}\right]$
$= \ln\left[\dfrac{0.516882538}{0.0625}\right]$
$= \ln 8.270120604$
$= 2.112649092$
Diff: 2 Type: SA Page Ref: 63-69
Topic: 2.4 Logarithms - Basic Aspects
Objective: 2-4: Write exponential equations in logarithmic form and use an electronic calculator equipped with a natural logarithm function to determine the value of natural logarithms.

110) Solve: $8x = 40$
Answer: $x = \dfrac{40}{8} = 5$
Diff: 3 Type: SA Page Ref: 71-75
Topic: 2.5 Solving Basic Equations
Objective: 2-5: Solve basic equations using addition, subtraction, multiplication, and division.

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111) Solve: $2x = 40$

Answer: $x = \frac{40}{2} = 20$

Diff: 3 Type: SA Page Ref: 71-75
Topic: 2.5 Solving Basic Equations
Objective: 2-5: Solve basic equations using addition, subtraction, multiplication, and division.

112) Solve: $-5x = 35$

Answer: $x = \frac{35}{-5} = -7$

Diff: 1 Type: SA Page Ref: 71-75
Topic: 2.5 Solving Basic Equations
Objective: 2-5: Solve basic equations using addition, subtraction, multiplication, and division.

113) Solve: $-\frac{2}{3}x = 48$

Answer: $-\frac{2}{3}x = 48$, $x = -72$

Diff: 2 Type: SA Page Ref: 71-75
Topic: 2.5 Solving Basic Equations
Objective: 2-5: Solve basic equations using addition, subtraction, multiplication, and division.

114) Solve: $0.04x = 37$

Answer: $x = \frac{37}{.04} = 925$

Diff: 1 Type: SA Page Ref: 71-75
Topic: 2.5 Solving Basic Equations
Objective: 2-5: Solve basic equations using addition, subtraction, multiplication, and division.

115) Solve: $\frac{x}{4} = 0.24$

Answer: $x = 0.24(4) = 0.96$
Diff: 1 Type: SA Page Ref: 71-75
Topic: 2.5 Solving Basic Equations
Objective: 2-5: Solve basic equations using addition, subtraction, multiplication, and division.

116) Solve: $\frac{x}{8} = 0.3$

Answer: $x = 0.3(8) = 2.4$
Diff: 1 Type: SA Page Ref: 71-75
Topic: 2.5 Solving Basic Equations
Objective: 2-5: Solve basic equations using addition, subtraction, multiplication, and division.

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117) Solve: $-\frac{1}{8}x = 15$

Answer: $x = 15 * -8$, $x = -120$
Diff: 1 Type: SA Page Ref: 71-75
Topic: 2.5 Solving Basic Equations
Objective: 2-5: Solve basic equations using addition, subtraction, multiplication, and division.

118) Solve: $-\frac{4}{3}x = -49$

Answer: $x = -49 * \frac{-3}{4} = \frac{147}{4} = 36.75$

Diff: 1 Type: SA Page Ref: 71-75
Topic: 2.5 Solving Basic Equations
Objective: 2-5: Solve basic equations using addition, subtraction, multiplication, and division.

119) Solve: $-3x = 9 - 6x$
Answer: $3x = 9$, $x = 3$
Diff: 1 Type: SA Page Ref: 71-75
Topic: 2.5 Solving Basic Equations
Objective: 2-5: Solve basic equations using addition, subtraction, multiplication, and division.

120) Solve: $3x = 9 + 12x$
Answer: $-9x = 9$, $x = -1$
Diff: 1 Type: SA Page Ref: 71-75
Topic: 2.5 Solving Basic Equations
Objective: 2-5: Solve basic equations using addition, subtraction, multiplication, and division.

121) Solve: $2x + 17 = 7x - 15$
Answer: $17 + 15 = 7x - 2x$, $32 = 5x$, $6.4 = x$
Diff: 1 Type: SA Page Ref: 71-75
Topic: 2.5 Solving Basic Equations
Objective: 2-5: Solve basic equations using addition, subtraction, multiplication, and division.

122) Solve: $2x + 17 = 8x - 3$
Answer: $17 + 3 = 8x - 2x$, $20 = 6x$, $3.3333 = x$
Diff: 1 Type: SA Page Ref: 71-75
Topic: 2.5 Solving Basic Equations
Objective: 2-5: Solve basic equations using addition, subtraction, multiplication, and division.

123) Solve: $x - 0.23x = 2105$
Answer: $.77x = 2105$, $x = \frac{2105}{.77} = 2733.766$

Diff: 1 Type: SA Page Ref: 71-75
Topic: 2.5 Solving Basic Equations
Objective: 2-5: Solve basic equations using addition, subtraction, multiplication, and division.

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124) Solve: $x + 0.307x = 640.20$
Answer: $1.307x = 640.20$, $x = \frac{640.20}{1.307} = 489.824$

Diff: 1 Type: SA Page Ref: 71-75
Topic: 2.5 Solving Basic Equations
Objective: 2-5: Solve basic equations using addition, subtraction, multiplication, and division.

125) Solve: $51 - 14x = -34 - x$
Answer: $51 + 34 = -x + 14x$, $85 = 13x$, $6.538462 = x$
LS: $51 - 14(6.538462) = 51 - 91.53846 = -40.53846$
RS: $-34 - 6.53846 = -40.53846$
Diff: 1 Type: SA Page Ref: 71-75
Topic: 2.5 Solving Basic Equations
Objective: 2-5: Solve basic equations using addition, subtraction, multiplication, and division.

126) Solve: $4x - 8 - 19x = 210 + 7x - 4$
Answer: $4x - 8 - 19x = 210 + 7x - 4$
$-15x - 8 = 206 + 7x$
$-8 - 206 = 7x + 15x$
$-214 = 22x$
$-9.7272727 = x$
LS: $= 4(-9.7272727) - 8 - 19(-9.7272727)$
$= -38.909091 - 8 + 184.81818$
$= 137.90909$
RS: $= 210 + 7(-9.7272727) - 4$
$= 206 - 68.090909$
$= 137.90909$
Diff: 1 Type: SA Page Ref: 71-75
Topic: 2.5 Solving Basic Equations
Objective: 2-5: Solve basic equations using addition, subtraction, multiplication, and division.

127) Solve: $\frac{52}{3} - \frac{2}{5}x = \frac{11}{6}x - \frac{1}{30}$
Answer: $\frac{52}{3} - \frac{2}{5}x = \frac{11}{6}x - \frac{1}{30}$, $\frac{52}{3} + \frac{1}{30} = \frac{11}{6}x + \frac{2}{5}x$
$520 + 1 = 55x + 12x$, $521 = 67x$, $7.7761194 = x$
Diff: 2 Type: SA Page Ref: 71-75
Topic: 2.5 Solving Basic Equations
Objective: 2-5: Solve basic equations using addition, subtraction, multiplication, and division.

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128) Solve: $10(3 - x) + 2(x - 2) = 6(2x - 2)$
Answer: $10(3 - x) + 2(x - 2) = 6(2x - 2)$
$30 - 10x + 2x - 4 = 12x - 12$
$-10x + 2x - 12x = -12 - 30 + 4$
$-20x = -38$
$x = 1.9$
Diff: 2 Type: SA Page Ref: 76-79
Topic: 2.6 Solving Equations Involving Algebraic Simplification
Objective: 2-6: Solve equations involving algebraic simplification and formula rearrangement.

129) Solve: $4(2x - 5) + 3 = 3(x - 4)$
Answer: $4(2x - 5) + 3 = 3(x - 4)$
$8x - 20 + 3 = 3x - 12$
$8x - 3x = -12 + 20 - 3$
$5x = 5$
$x = 1$
Diff: 2 Type: SA Page Ref: 76-79
Topic: 2.6 Solving Equations Involving Algebraic Simplification
Objective: 2-6: Solve equations involving algebraic simplification and formula rearrangement.

130) Solve: $x - \frac{x}{2} = \frac{x}{4} + 1$

Answer: $x - \frac{x}{2} = \frac{x}{4} + 1$

$(4)x - (4)\frac{x}{2} = (4)\frac{x}{4} + (4)1$

$4x - 2x = x + 4$
$4x - 2x - x = 4$
$x = 4$
Diff: 2 Type: SA Page Ref: 76-79
Topic: 2.6 Solving Equations Involving Algebraic Simplification
Objective: 2-6: Solve equations involving algebraic simplification and formula rearrangement.

131) Solve: $\frac{3}{4} - \frac{x}{8} - \frac{x + 2}{6} = 1$

Answer: $\frac{3}{4} - \frac{x}{8} - \frac{x + 2}{6} = 1$

$(24)\frac{3}{4} - (24)\frac{x}{8} - (24)\frac{x + 2}{6} = (24)1$

$(6)3 - 3x - (4)(x + 2) = 24$
$18 - 3x - 4x - 8 = 24$
$-7x = 14$
$x = -2$
Diff: 2 Type: SA Page Ref: 76-79
Topic: 2.6 Solving Equations Involving Algebraic Simplification
Objective: 2-6: Solve equations involving algebraic simplification and formula rearrangement.

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132) Solve: $5(2x - 4) - 3(1 - 3x) = -64$
Answer: $5(2x - 4) -3(1 - 3x) = -64$
$10x - 20 - 3 + 9x = -64$
$19x = -41$
$x = 2.1578947$
LS: $5[2(-2.1578947) - 4] - 3[1 - 3(-2.1578947)] = -64$
$5[-4.3157895 - 4] - 3[1 - (-6.4736842)] = -64$
$5[-8.3157895] - 3[7.4736842] = -64$
$-41.578948 - 22.421053 = -64$
$-64 = -64$
RS: $= -64$
Diff: 2 Type: SA Page Ref: 76-79
Topic: 2.6 Solving Equations Involving Algebraic Simplification
Objective: 2-6: Solve equations involving algebraic simplification and formula rearrangement.

133) Solve: $17 - 4(2x - 7) = 15x - 3(2x - 3)$
Answer: $17 - 4(2x - 7) = 15x - 3(2x - 3)$
$17 - 8x + 28 = 15x - 6x + 9$
$45 - 8x = 9x + 9$
$36 = 17x$
$2.117647 = x$
LS: $17 - 4[2(2.117647) - 7]$
$17 - 4(4.2353941 - 7)$
$17 - 4(-2.7647059)$
$17 + 11.058824$
28.058824
RS: $15(2.117647) - 3[2(2.117647) - 3]$
$31.764706 - 3[4.2352941 - 3]$
$31.764706 - 3[1.2352941]$
$31.764706 - 3.7058823 = 28.058824$
Diff: 2 Type: SA Page Ref: 76-79
Topic: 2.6 Solving Equations Involving Algebraic Simplification
Objective: 2-6: Solve equations involving algebraic simplification and formula rearrangement.

134) Solve: $x + \frac{5}{9}x = 126$

Answer: $x + \frac{5}{9}x = 126$, $\frac{14}{9}x = 126$, $x = 126 \times \frac{9}{14}$, $x = 81$

Diff: 2 Type: SA Page Ref: 76-79
Topic: 2.6 Solving Equations Involving Algebraic Simplification
Objective: 2-6: Solve equations involving algebraic simplification and formula rearrangement.

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135) Solve: $2 - \frac{1}{2}x = \frac{2}{3}x + \frac{25}{9}$

Answer: $2 - \frac{1}{2}x = \frac{2}{3}x + \frac{25}{9}$

$36 - 9x = 12x + 50$
$-14 = 21x$
$-\frac{2}{3} = x$

Diff: 2 Type: SA Page Ref: 76-79
Topic: 2.6 Solving Equations Involving Algebraic Simplification
Objective: 2-6: Solve equations involving algebraic simplification and formula rearrangement.

136) Solve: $\frac{14}{5}(4 - 3x) + \frac{23}{40} = \frac{7}{10}x - \frac{3}{8}(2x - 3)$

Answer: $\frac{14}{5}(4 - 3x) + \frac{23}{40} = \frac{7}{10}x - \frac{3}{8}(2x - 3)$

$112(4 - 3x) + 23 = 28x - 15(2x - 3)$
$448 - 336x + 23 = 28x - 30x + 45$
$471 - 336x = -2x + 45$
$426 = 334x$
$1.2754491 = x$
Diff: 3 Type: SA Page Ref: 76-79
Topic: 2.6 Solving Equations Involving Algebraic Simplification
Objective: 2-6: Solve equations involving algebraic simplification and formula rearrangement.

137) Solve: $\frac{4}{3}(5x - 2) - \frac{3}{5}(16x - 3) = \frac{17}{60} + 3x$

Answer: $\frac{4}{3}(5x - 2) - \frac{3}{5}(16x - 3) = \frac{17}{60} + 3x$

$80(5x - 2) - 36(16x - 3) = 17 + 180x$
$400x - 160 - 576x + 108 = 17 + 180x$
$-176x - 52 = 17 + 180x$
$-69 = 356x$
$-.1938202 = x$
Diff: 3 Type: SA Page Ref: 76-79
Topic: 2.6 Solving Equations Involving Algebraic Simplification
Objective: 2-6: Solve equations involving algebraic simplification and formula rearrangement.

138) Solve: $I = Prt$ for r

Answer: $I = Prt$, $r = \frac{I}{Pt}$

Diff: 1 Type: SA Page Ref: 76-79
Topic: 2.6 Solving Equations Involving Algebraic Simplification
Objective: 2-6: Solve equations involving algebraic simplification and formula rearrangement.

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139) Solve: I = Prt for t

Answer: I = Prt, $t = \frac{I}{Pr}$

Diff: 1 Type: SA Page Ref: 76-79
Topic: 2.6 Solving Equations Involving Algebraic Simplification
Objective: 2-6: Solve equations involving algebraic simplification and formula rearrangement.

140) Solve: $\frac{(R + r)}{r} = \frac{V}{v}$ for V

Answer: $\frac{(R + r)}{r} = \frac{V}{v}$

$v(R + r) = Vr$

$V = \frac{v(R + r)}{r}$

Diff: 2 Type: SA Page Ref: 76-79
Topic: 2.6 Solving Equations Involving Algebraic Simplification
Objective: 2-6: Solve equations involving algebraic simplification and formula rearrangement.

141) Solve: $Q = \frac{p - q}{4}$ for p

Answer: $Q = \frac{p - q}{4}$, $4Q = p - q$, $4Q + q = p$

Diff: 2 Type: SA Page Ref: 76-79
Topic: 2.6 Solving Equations Involving Algebraic Simplification
Objective: 2-6: Solve equations involving algebraic simplification and formula rearrangement.

142) Solve: $P = S(1 + i)^{-n}$ for i

Answer: $P = S(1 + i)^{-n}$, $\frac{P}{S} = (1 + i)^{-n}$,

$\left[\frac{P}{S}\right]^{-1/n} = 1 + i$, $\left[\frac{S}{P}\right]^{1/n} = 1 + i$,

$i = \left[\frac{S}{P}\right]^{1/n} - 1$

Diff: 3 Type: SA Page Ref: 76-79
Topic: 2.6 Solving Equations Involving Algebraic Simplification
Objective: 2-6: Solve equations involving algebraic simplification and formula rearrangement.

143) Solve: $S = P(1 + rt)$ for t

Answer: $S = P(1 + rt)$, $S = P + Prt$, $S - P = Prt$

$t = \frac{S - P}{Pr}$

Diff: 2 Type: SA Page Ref: 76-79
Topic: 2.6 Solving Equations Involving Algebraic Simplification
Objective: 2-6: Solve equations involving algebraic simplification and formula rearrangement.

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144) Solve: $D = \frac{1}{E + F}$ for F

Answer: $D = \frac{1}{E + F}$, $\frac{1}{D} = E + F$, $F = \frac{1}{D} - E$

Diff: 3 Type: SA Page Ref: 76-79
Topic: 2.6 Solving Equations Involving Algebraic Simplification
Objective: 2-6: Solve equations involving algebraic simplification and formula rearrangement.

145) Solve: $\frac{a + b}{b} = \frac{c}{d}$ for b

Answer: $\frac{a + b}{b} = \frac{c}{d}$

$d(a + b) = bc$
$ad + bd = bc$
$ad = bc - bd$
$ad = b(c - d)$
$b = \frac{ad}{(c - d)}$

Diff: 2 Type: SA Page Ref: 76-79
Topic: 2.6 Solving Equations Involving Algebraic Simplification
Objective: 2-6: Solve equations involving algebraic simplification and formula rearrangement.

146) Conor had to pay income taxes of $3 440.00 plus 22% of the amount by which his taxable income exceeded $36 000.00. If his tax bill was $3 684.00, calculate his taxable income.
Answer: Let the taxable income (in dollars) be x.
Then x - 36 000 is the amount that his income is greater than $36 000.

$3440 + 0.22(x - 36\,000) = 3684$
$3440 + 0.22x - 7920 = 3684$
$0.22x = 8164$
$x = \$37\,109.09$
Diff: 2 Type: SA Page Ref: 81-84
Topic: 2.7 Solving Word Problems
Objective: 2-7: Solve word problems by creating and solving equations.

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147) Taylor invests part of her $2 000 savings into a savings account at 6% and part into a GIC at 8% simple interest. If she gets $150 in interest from the two investments, calculate how much she invested at each rate.
Answer: Let the amount invested at 6% be $$x$.
Then the amount invested at 8% is (2000 - x).

0.06x + 0.08(2000 - x) = 150
0.06x + 160 - 0.08x = 150
-0.02x = -10
x = $500.00 at 6%
2000 - 500 = $1500.00 at 8%
Diff: 2 Type: SA Page Ref: 81-84
Topic: 2.7 Solving Word Problems
Objective: 2-7: Solve word problems by creating and solving equations.

148) Bow Valley Electronics sold a mini stereo set during a sale for $776. Determine the regular selling price of the set if the price of the set had been reduced by 1/4 of the original regular selling price.
Answer: Let the regular selling price be $$x$.
Sale price = $$\left[x - \frac{1}{4}x\right]$$

$\therefore \quad x - \frac{1}{4}x = 776$

4x - x = 3104
3x = 3104
x = 1034.67
The regular selling price was $1034.67.
Diff: 2 Type: SA Page Ref: 81-84
Topic: 2.7 Solving Word Problems
Objective: 2-7: Solve word problems by creating and solving equations.

149) After an increase of 1/9 of his current hourly wage, Pierre will receive a new hourly wage of $12.35. How much is his hourly wage before the increase?
Answer: Let the original hourly wage be $$x$.
New hourly wage = $$\left[x + \frac{1}{9}x\right]$$

$\therefore \quad x + \frac{1}{9}x = 12.35$

9x + x = 111.15
10x = 111.15
x = 11.12
The hourly wage before increase was $11.12.
Diff: 2 Type: SA Page Ref: 81-84
Topic: 2.7 Solving Word Problems
Objective: 2-7: Solve word problems by creating and solving equations.

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150) After a reduction of $\frac{1}{14}$ of the selling price, a VCR was sold for $470.00. Determine the regular selling price.
Answer: Let the regular price be y.
Then reduction in price is $\frac{1}{14}y$.

$y - \frac{1}{14}y = 470$

$\frac{13}{14}y = 470$

$y = \$506.15$
The regular selling price is $506.15.
Diff: 2 Type: SA Page Ref: 81-84
Topic: 2.7 Solving Word Problems
Objective: 2-7: Solve word problems by creating and solving equations.

151) A rubber tube 120 cm long is cut into two pieces so that the longer piece is 30 cm longer than twice the length of the shorter piece. What is the length of the longer piece?
Answer: Let the shorter piece be x cm.
Length of the longer piece = $(2x + 30)$ cm.
Total length = $(x + 2x + 30)$ cm.
$\therefore \quad x + 2x + 30 = 120$
$3x = 90$
$x = 30$
The longer piece is 2(30) cm + 15 cm = 75 cm.
Diff: 2 Type: SA Page Ref: 81-84
Topic: 2.7 Solving Word Problems
Objective: 2-7: Solve word problems by creating and solving equations.

152) A clothing store sells fancy hats at a gross margin of $3.50 each and ordinary hats at a gross margin of $5.00 each. During July, 110 hats were sold for a total gross margin of $460.00. How many fancy hats were sold?
Answer: Let the number of fancy hats be y.
Then the number of ordinary hats = $110 - y$.
The total gross margin on fancy hats = $\$5(y)$.
The total gross margin on ordinary hats = $\$3.5(110 - y)$
$5y + 3.5(110 - y) = 460$
$5y + 385 - 3.5y = 460$
$1.5y = 75$
$y = 50$
The number of fancy hats sold = 50.
Diff: 2 Type: SA Page Ref: 81-84
Topic: 2.7 Solving Word Problems
Objective: 2-7: Solve word problems by creating and solving equations.

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153) An electronics company has been producing 1705 CD Players a day working two shifts. The second shift has produced 95 CD players fewer than four-fifths of the number of CD players produced by the first shift. Determine the number of CD players produced by the second shift.
Answer: Let the number of CD players produced by the first shift be x.
Number of CD players produced by the second shift = $\frac{4}{5}x$ - 95.

Total production = $x + \frac{4}{5}x - 95 = 1705$

$\therefore \quad x + \frac{4}{5}x - 95 = 1705$

$\frac{9}{5}x = 1800$

$x = 1000$
Production by the second shift is $\frac{4}{5}x(1000) - 95 = 705$.

Diff: 2 Type: SA Page Ref: 81-84
Topic: 2.7 Solving Word Problems
Objective: 2-7: Solve word problems by creating and solving equations.

154) A machine requires five hours to make a unit of Product A and six hours to make a unit of Product B. Last month the machine operated for 250 hours producing a total of 60 units. How many units of Product A were produced?
Answer: Let the number of units of product A be x.
Then the number of units of product B is 60 - x.
The number of hours for product A is $5x$.
The number of hours for product B is $6(60 - x)$.
$\therefore \quad 5x + 6(60 - x) = 350$
$5x + 360 - 6x = 350$
$-x = -10$
$x = 10$
Production of product A is 10 units.
Diff: 2 Type: SA Page Ref: 81-84
Topic: 2.7 Solving Word Problems
Objective: 2-7: Solve word problems by creating and solving equations.

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155) The local amateur soccer club spent $1640 on tickets to a professional hockey game. If the club bought 2.5 times as many eight-dollar tickets than the number of twelve-dollar tickets and four fewer fifteen-dollar tickets than 7/10 the number of twelve dollar tickets, how many of each type of ticket did the club buy?
Answer: Let the number of $12 tickets be x.
Number of $8 tickets = $2.5x$
Number of $15 tickets = $\frac{7}{10}x - 4$

Value of the $12 tickets = $\$12x$
Value of the $8 tickets = $\$8(2.5x)$
Value of the $15 tickets = $\$15(\frac{7}{10}x - 4)$

$\therefore \quad 12x + 8(2.5x) + 15\ (7/10x - 4) = \$1640$
$12x + 20x + 10.5x - 60 = 1640$
$42.5x = 1700$
$x = 40$
Sales were 40 $12 tickets, 100 $8 tickets, and 24 $15 tickets.
Diff: 3 Type: SA Page Ref: 81-84
Topic: 2.7 Solving Word Problems
Objective: 2-7: Solve word problems by creating and solving equations.

156) Evaluate s: $s = ut + \frac{1}{2}at^2$ for u = 15, a = 32, t = 5

Answer: $s = 15(5) + \frac{1}{2}(32)(5)^2$

$= 75 + 400$
$= 475$
Diff: 2 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

157) Evaluate s: $s = ut + \frac{1}{2}at^2$ for u = 20, a = 10, t = 5

Answer: $s = 20(5) + \frac{1}{2}(10)(5)^2$

$= 100 + 125$
$= 225$
Diff: 2 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

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158) Evaluate z: $z = 5x^2 - 5xy - 3y^2$ for $x = -6$, $y = +5$

Answer: $z = 5(-6)^2 - 5(-6)(5) - 3(5)^2$

$= 5(36) + 150 - 3(25)$

$= 180 + 150 - 75$

$= 255$

Diff: 2 Type: SA Page Ref: 44-49

Topic: 2.1 Simplification of Algebraic Expressions

Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

159) Evaluate c: $c = 8(7a - 4b) - 4(5a + 3b)$ for $a = \frac{1}{3}$, $b = -\frac{5}{4}$

Answer: $c = 8\left[7\left(\frac{1}{3}\right) - 4\left(-\frac{5}{4}\right)\right] - 4\left[5\left(\frac{1}{3}\right) + 3\left(-\frac{5}{4}\right)\right]$

$= 8\left(\frac{7}{3} + \frac{20}{4}\right) - 4\left(\frac{5}{3} - \frac{15}{4}\right)$

$= \frac{56}{3} + \frac{160}{4} - \frac{20}{3} + \frac{60}{4}$

$= \frac{36}{3} + \frac{220}{4} = 12 + 55 = 67$

Diff: 3 Type: SA Page Ref: 44-49

Topic: 2.1 Simplification of Algebraic Expressions

Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

160) Evaluate K: $K = \frac{2NC}{P(n+1)}$ for N = 112, C = 250, P = 2450, $n = 24$

Answer: For N = 12, C = 400, P = 2000, $n = 24$

$K = \frac{2NC}{P(n+1)} = \frac{2(112)(250)}{2450(24+1)} = \frac{56000}{61250} = .914286$

Diff: 3 Type: SA Page Ref: 44-49

Topic: 2.1 Simplification of Algebraic Expressions

Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

161) Evaluate T: $T = \frac{I}{Pr}$ for I = 224, P = 6700, $r = 0.11$

Answer: For I = 324, P = 5400, $r = 0.15$

$T = \frac{I}{Pr} = \frac{224}{6700x.11} = \frac{224}{737} = .3039349$

Diff: 3 Type: SA Page Ref: 44-49

Topic: 2.1 Simplification of Algebraic Expressions

Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

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162) Evaluate P: P = S(1 - dt) for S = 1886, d = 0.15, $t = \frac{249}{365}$

Answer: $P = 1886\left[1 - .15 \times \frac{249}{365}\right]$

$= 1886(1 - .15 \times .6821918)$

$= 1886(1 - .1023288)$

$= 1886(.8976712)$

$= 1693.01$

Diff: 2 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

163) Evaluate P: $P = \frac{S}{1 + rt}$ for S = 1665, r = 0.14, $t = \frac{292}{365}$

Answer: $P = \frac{1665}{1 + .14 \times \frac{292}{365}} = \frac{1665}{1 + .14 \times .8} = \frac{1665}{1 + .112} = \frac{1665}{1.112} = \$1497.30$

Diff: 3 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

164) Evaluate P: $P = \frac{S}{1 + rt}$ for S = 1000, r = 0.1, $t = \frac{180}{360}$

Answer: $P = \frac{1000}{1 + .1 \times \frac{180}{360}} = \frac{1000}{1 + .1 \times .5} = \frac{1000}{1 + .05} = \frac{1000}{1.05} = \$952.38$

Diff: 3 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

165) Compute: $\sqrt[19]{1.36}$

Answer: $\sqrt[19]{1.36} = 1.016315$

Diff: 2 Type: SA Page Ref: 59-62
Topic: 2.3 Fractional Exponents
Objective: 2-3: Use an electronic calculator to compute the numerical value of arithmetic expressions involving fractional exponents.

166) Compute: $\frac{1 - 1.04^{-35}}{0.05}$

Answer: $\frac{1 - 1.04^{-35}}{.05} = \frac{1 - .2534155}{.05} = \frac{.7465845}{.05} = 14.93169$

Diff: 3 Type: SA Page Ref: 59-62
Topic: 2.3 Fractional Exponents
Objective: 2-3: Use an electronic calculator to compute the numerical value of arithmetic expressions involving fractional exponents.

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167) Compute: $\frac{1 - 1.02^{-40}}{0.02}$

Answer: $\frac{1 - 1.02^{-40}}{.02} = \frac{1 - .4528904152}{.02} = \frac{.5471095848}{.02} = 27.36$

Diff: 3 Type: SA Page Ref: 59-62
Topic: 2.3 Fractional Exponents
Objective: 2-3: Use an electronic calculator to compute the numerical value of arithmetic expressions involving fractional exponents.

168) Compute: ln 1.257
Answer: ln 1.257 = .228728
Diff: 1 Type: SA Page Ref: 63-69
Topic: 2.4 Logarithms - Basic Aspects
Objective: 2-4: Write exponential equations in logarithmic form and use an electronic calculator equipped with a natural logarithm function to determine the value of natural logarithms.

169) Compute: $\ln[3.00e^{-.3}]$
Answer: $\ln(3.00e^{-.3})$
$= \ln 3.00 + \ln e^{-.3}$
$= \ln 3.00 - .3 \ln e$
$= 1.0986123 - .3$
$= .7986123$
Diff: 3 Type: SA Page Ref: 63-69
Topic: 2.4 Logarithms - Basic Aspects
Objective: 2-4: Write exponential equations in logarithmic form and use an electronic calculator equipped with a natural logarithm function to determine the value of natural logarithms.

170) Solve: $x - 0.26x = 8.96$
Answer: $x - .26x = 8.96$, $.74x = 8.96$, $x = 12.10811$
Diff: 1 Type: SA Page Ref: 71-75
Topic: 2.5 Solving Basic Equations
Objective: 2-5: Solve basic equations using addition, subtraction, multiplication, and division.

171) Solve: $x - 0.75x = 9.00$
Answer: $x - .75x = 9.00$, $.25x = 9.00$, $x = 36.00$
Diff: 1 Type: SA Page Ref: 71-75
Topic: 2.5 Solving Basic Equations
Objective: 2-5: Solve basic equations using addition, subtraction, multiplication, and division.

172) Solve: $0.4x - 4 = 6 - 0.8x$
Answer: $.4x - 4 = 6 - .8x$, $1.2x = 10$, $x = 8.33333333$
Diff: 1 Type: SA Page Ref: 71-75
Topic: 2.5 Solving Basic Equations
Objective: 2-5: Solve basic equations using addition, subtraction, multiplication, and division.

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173) Solve: $(3 - 5x) - (9x - 1) = 80$
Answer: $(3 - 5x) - (9x - 1) = 80$
$3 - 5x - 9x + 1 = 80$
$4 - 14x = 80$
$-14x = 76$
$x = -5.42857$
Diff: 2 Type: SA Page Ref: 76-79
Topic: 2.6 Solving Equations Involving Algebraic Simplification
Objective: 2-6: Solve equations involving algebraic simplification and formula rearrangement.

174) Solve: $5(8x - 2) - 5(3x + 5) = 36$
Answer: $5(8x - 2) -5(3x + 5) = 36$
$40x - 10 -15x - 25 = 36$
$25x - 35 = 36$
$25x = 71$
$x = 2.84$
Diff: 2 Type: SA Page Ref: 76-79
Topic: 2.6 Solving Equations Involving Algebraic Simplification
Objective: 2-6: Solve equations involving algebraic simplification and formula rearrangement.

175) Solve: $x + \frac{7}{10}x + \frac{1}{2} + x + \frac{4}{5}x + 1 = 256$

Answer: $x + \frac{7}{10}x + \frac{1}{2} + x + \frac{4}{5}x + 1 = 256$

$x + .7x + 1.8x + 1.5 = 256$
$3.5x = 254.5$
$x = 72.71429$
Diff: 3 Type: SA Page Ref: 76-79
Topic: 2.6 Solving Equations Involving Algebraic Simplification
Objective: 2-6: Solve equations involving algebraic simplification and formula rearrangement.

176) After reducing the regular selling price by 1/7, Moon Electronics sold a TV set for $294. What was the regular selling price?
Answer: Let the regular selling price be $\$x$.
Reduction in price + $\$\frac{1}{7}x$

$x - \frac{1}{7}x = 294$

$\frac{6}{7}x = 294$

$x = \$343.00$
Diff: 2 Type: SA Page Ref: 81-84
Topic: 2.7 Solving Word Problems
Objective: 2-7: Solve word problems by creating and solving equations.

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177) After reducing the regular selling price by 1/8,
Sepaba Inc. sold a Stereo set for $300. What was the regular selling price?
Answer: Let the regular selling price be $$x$.
Reduction in price + $$\$\frac{1}{8}x$$

$$x - \frac{1}{8}x = 300$$

$$\frac{7}{8}x = 300$$

$$x = \$342.86$$
Diff: 2 Type: SA Page Ref: 81-84
Topic: 2.7 Solving Word Problems
Objective: 2-7: Solve word problems by creating and solving equations.

178) The zinc department of a factory occupies 500 square metres more than 2 times the floor space occupied by the copper department. The total floor space is 9500 square metres. Determine the floor space occupied by the cooper department.
Answer: Let the floor space occupied by copper be x.
Floor space occupied by zinc = $2x + 500$
Total floor space = $x + 2x + 500$
$\therefore \quad x + 2x + 500 = 9500$
$3x = 9000$
$x = 3000$
The floor space occupied by copper is 3000 square metres.
Diff: 2 Type: SA Page Ref: 81-84
Topic: 2.7 Solving Word Problems
Objective: 2-7: Solve word problems by creating and solving equations.

179) A company employs 204 employees. There are three shifts. There are three times as many on the first shift as on the second shift, and four more on the third shift than on the second shift. Determine how many were on each shift.
Answer: Let x be the number on the second shift.
Then $3x$ is the number on the first shift.
And $x + 4$ is the number on the third shift.
$x + 3x + (x + 4) = 204$
$5x = 200$
$x = 40$ on the second shift
$3x = 120$ on the first shift
$x + 4 = 44$ on the third shift
Diff: 2 Type: SA Page Ref: 81-84
Topic: 2.7 Solving Word Problems
Objective: 2-7: Solve word problems by creating and solving equations.

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180) A machine requires 4 hours to make a unit of Product A and 7 hours to make a unit of Product B. The machine operated for 810 hours producing a total of 150 units. How many units of Product B were produced?
Answer: Let the number of units of Product A be x.
Number of units of Product B = $150 - x$.
Number of hours for Product A = $4x$.
Number of hours for Product B = $7(150 - x)$.
$\therefore$ $4x + 7(150 - x) = 810$
$4x + 1050 - 7x = 810$
$-3x = -240$
$x = 80$
The number of units if Product B is $150 - 80 = 70$.
Diff: 2 Type: SA Page Ref: 81-84
Topic: 2.7 Solving Word Problems
Objective: 2-7: Solve word problems by creating and solving equations.

181) Simplify: $(5x - 4)(3x + 1)$
A) $15x^2 - 7x + 4$
B) $15x^2 - 7x - 4$
C) $15x^2 + 7x - 4$
D) $-15x^2 - 7x + 4$
E) $-10x^2 - 7x + 4$
Answer: B
Diff: 1 Type: MC Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

182) Simplify: $\frac{25a^6b^8c^{10}}{5a^2b^4c^5}$
A) $20a^4b^4c^5$
B) $5a^4b^4c^5$
C) $5a^3b^2c^2$
D) $20a^3b^2c^2$
E) $55a^4b^4c^5$
Answer: B
Diff: 1 Type: MC Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

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183) Simplify: $(3)^2(3)^5$
A) 30
B) 90
C) 59 049
D) 2187
E) 120
Answer: D
Diff: 1 Type: MC Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

184) Simplify: $\left[(2^3)^4\right]^2$
A) 16777216
B) 17666216
C) 12222617
D) 17222167
E) 17333167
Answer: A
Diff: 1 Type: MC Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

185) Compute the value of (four decimal places): $\frac{4^{-7}}{3^{-6}}$

A) .0045
B) .5449
C) .4459
D) .0445
E) 0.044946
Answer: E
Diff: 1 Type: MC Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

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186) Simplify: $(m^2)^6$
A) m^{12}
B) m^{-4}
C) m^8
D) m^3
E) m^2
Answer: A
Diff: 1 Type: MC Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

187) Simplify: $[(3^3) - 6^2]^3$
A) 279
B) -279
C) 729
D) -729
E) 972
Answer: D
Diff: 1 Type: MC Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

188) Calculate the following: $\ln\left[1.67 \times \left(\frac{2.13^{-15}}{.0034}\right)\right]$
A) 5.145
B) 1.545
C) -5.154
D) -1.545
E) -5.145
Answer: E
Diff: 1 Type: MC Page Ref: 63-69
Topic: 2.4 Logarithms - Basic Aspects
Objective: 2-4: Write exponential equations in logarithmic form and use an electronic calculator equipped with a natural logarithm function to determine the value of natural logarithms.

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189) Solve the following equation: $5x - 4 + 9 = -3x - 2 - 13$
A) 2.5
B) -2.5
C) 20
D) -20
E) -25
Answer: B
Diff: 1 Type: MC Page Ref: 71-75
Topic: 2.5 Solving Basic Equations
Objective: 2-5: Solve basic equations using addition, subtraction, multiplication, and division.

190) Solve the following and check your solutions: $12x + 5(9 - x) = 429$
A) 58.86
B) -58.86
C) 54.14
D) -54.14
E) -5.14
Answer: A
Diff: 1 Type: MC Page Ref: 76-79
Topic: 2.6 Solving Equations Involving Algebraic Simplification
Objective: 2-6: Solve equations involving algebraic simplification and formula rearrangement.

191) You have a lotto ticket with three numbers between zero and 49. The total of the three numbers is 93. One number is twice as large plus two as the lowest number. The second number is $\frac{4}{3}$ the size of the smaller number. What are the values of each of the numbers?

A) 1-44, 2-28, 3-21
B) 1-41, 2-31, 3-21
C) 1-44, 2-25, 3-24
D) 1-44, 2-20, 3-15
E) 1-44, 2-15, 3-20
Answer: A
Diff: 3 Type: MC Page Ref: 81-84
Topic: 2.7 Solving Word Problems
Objective: 2-7: Solve word problems by creating and solving equations.

192) Simplify: $11.5784^{3/7}$
A) 3.857
B) 4.857
C) 2.857
D) 2.587
E) 4.785
Answer: C
Diff: 1 Type: MC Page Ref: 59-62
Topic: 2.3 Fractional Exponents
Objective: 2-3: Use an electronic calculator to compute the numerical value of arithmetic expressions involving fractional exponents.

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193) You have three colors of candies a jar - yellow, red and blue. There are 4 times plus 3 as many yellow candies as there are blue candies. There is 5/8 as many minus 6 red candies as there are blue. There are a total of 402 candies in the jar. How many of yellow, blue and red candies are there?
A) y-290, b-73, r-39
B) y-291, b-73, r-38
C) y-291, b-72, r-39
D) y-292, b-72, r-38
E) y-292, b-72, r-37
Answer: C
Diff: 3 Type: MC Page Ref: 81-84
Topic: 2.7 Solving Word Problems
Objective: 2-7: Solve word problems by creating and solving equations.

194) Following equation is used in carbon dating of the artefacts:

$$N = N_0 \times e^{\frac{-t}{\tau}}$$

where,
N = Decay rate of the artefact, expressed as disintegrations per minute (dpm)
N_0 = Decay rate of natural carbon = 14 dpm

τ = Mean life time = $\frac{\text{Half-life of C-14}}{\ln 2} = \frac{5730}{\ln 2} = 8267$ years

t = Age of the artefact
Calculate the age of the artefact, if the decay rate of the artefact is measured as 4 dpm

Answer: $N = N_0 \times e^{\frac{-t}{\tau}}$

$$\Rightarrow \frac{N}{N_0} = e^{\frac{-t}{\tau}}$$

$$\Rightarrow \ln\left(\frac{N}{N_0}\right) = \frac{-t}{\tau}\ln(e)$$

$$\Rightarrow t = -\tau \times \ln\left(\frac{N}{N_0}\right) \quad \text{because } \ln(e) = 1$$

Plugging the values in the above equation, we get:

$$t = -8267 \times \ln\left(\frac{4}{14}\right)$$

$$\Rightarrow t = -8267 \times -1.253$$

$$\Rightarrow t = 10357$$

Age of the artefact is 10,357 years
Diff: 3 Type: SA Page Ref: 63-69
Topic: 2.4 Logarithms - Basic Aspects
Objective: 2-4: Write exponential equations in logarithmic form and use an electronic calculator equipped with a natural logarithm function to determine the value of natural logarithms.

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195) Following equation is used in carbon dating of the artefacts:

$N = N_0 \times e^{\frac{-t}{\tau}}$

where,
N = Decay rate of the artefact, expressed as disintegrations per minute (dpm)
N_0 = Decay rate of natural carbon = 14 dpm

τ = Mean life time = $\frac{\text{Half-life of C-14}}{\ln 2} = \frac{5730}{\ln 2} = 8267$ years

t = Age of the artefact
What is the expected decay rate of the artefact, if it is known to be from Canadian New France era, 350 years ago.

Answer: $N = N_0 \times e^{\frac{-t}{\tau}}$

Plugging the values in the above equation, we get

$N = 14 \times e^{\frac{-350}{8267}} = 14 \times 0.959 = 13.4$ dpm

Diff: 2 Type: SA Page Ref: 63-69
Topic: 2.4 Logarithms - Basic Aspects
Objective: 2-4: Write exponential equations in logarithmic form and use an electronic calculator equipped with a natural logarithm function to determine the value of natural logarithms.

196) Find b, if $e^{-4b} = 0.25$
A) -0.0625
B) -1.386
C) -0.347
D) 0.347
E) -0.229
Answer: D
Diff: 2 Type: MC Page Ref: 63-69
Topic: 2.4 Logarithms - Basic Aspects
Objective: 2-4: Write exponential equations in logarithmic form and use an electronic calculator equipped with a natural logarithm function to determine the value of natural logarithms.

197) Calculate $\ln\left(200e^{(-4 \times 0.29)}\right)$
A) -1.16
B) 0.06
C) 6.458
D) 4.138
E) 198.84
Answer: D
Diff: 2 Type: MC Page Ref: 63-69
Topic: 2.4 Logarithms - Basic Aspects
Objective: 2-4: Write exponential equations in logarithmic form and use an electronic calculator equipped with a natural logarithm function to determine the value of natural logarithms.

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198) Calculate $\ln\left[900\left(\frac{1.025^{-30}}{0.025}\right)\right]$

A) 9.75
B) 17162
C) 2653.29
D) 10.52
E) 11.23
Answer: A
Diff: 2 Type: MC Page Ref: 63-69
Topic: 2.4 Logarithms - Basic Aspects
Objective: 2-4: Write exponential equations in logarithmic form and use an electronic calculator equipped with a natural logarithm function to determine the value of natural logarithms.

199) In the following equation:

$PV_n = PMT\left[\frac{1-(1+i)^{-n}}{i}\right]$

calculate n, if PV_n = 75,000; PMT = 3500; i = 0.028

Answer: Plugging the values in the above equation:

$$75000 = 3500\left[\frac{1-1.028^{-n}}{0.028}\right]$$

$\Rightarrow$ $0.6 = 1 - 1.028^{-n}$

$\Rightarrow$ $1.028^{-n} = 0.4$

$\Rightarrow$ $-n \ln(1.028) = \ln(0.4)$

$\Rightarrow$ $-n(0.027615) = -0.916291$

$\Rightarrow$ $n = 33.180706$

Diff: 2 Type: SA Page Ref: 63-69
Topic: 2.4 Logarithms - Basic Aspects
Objective: 2-4: Write exponential equations in logarithmic form and use an electronic calculator equipped with a natural logarithm function to determine the value of natural logarithms.

200) Evaluate $\ln\left(20\frac{300}{1.09}\right)$

A) 5505
B) 8.613
C) 112.35
D) 104.66
E) 8.786
Answer: B
Diff: 2 Type: MC Page Ref: 63-69
Topic: 2.4 Logarithms - Basic Aspects
Objective: 2-4: Write exponential equations in logarithmic form and use an electronic calculator equipped with a natural logarithm function to determine the value of natural logarithms.

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201) Simplify: $\left[\frac{3^3 \times 3^7}{3^{10}}\right]^{12}$

A) 3
B) 0.333
C) 531,441
D) 0.00000188
E) 1
Answer: E
Diff: 1 Type: MC Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

202) Simplify: $(2 + 0.025)^3$
A) 8.000015625
B) 8
C) 8.304
D) 11.39
E) 91.125
Answer: C
Diff: 1 Type: MC Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

203) Evaluate: $[(-2)^3]^5$
A) 32768
B) -32768
C) -40
D) 256
E) -30
Answer: B
Diff: 1 Type: MC Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

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204) Simplify $\left(\frac{1+n}{2}\right)^3$

A) $\frac{1}{8}+n^3$

B) $\left(\frac{1}{2}+n\right)^3$

C) $\left(\frac{1}{2}+\frac{n}{2}\right)^3$

D) $\frac{(1+n)^3}{8}$

E) $\left(\frac{1+n}{2}\right)^3$

Answer: D
Diff: 1 Type: MC Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

205) Evaluate $\left(\sqrt[3]{9}\right)^3$

A) 1
B) 9
C) 2.08
D) 729
E) $\frac{1}{9}$

Answer: B
Diff: 1 Type: MC Page Ref: 59-62
Topic: 2.3 Fractional Exponents
Objective: 2-3: Use an electronic calculator to compute the numerical value of arithmetic expressions involving fractional exponents.

206) Evaluate $5000(1+0.11)^5$

A) 0.08
B) 5000
C) 8425.29
D) 5281.12
E) 25000

Answer: C
Diff: 1 Type: MC Page Ref: 59-62
Topic: 2.3 Fractional Exponents
Objective: 2-3: Use an electronic calculator to compute the numerical value of arithmetic expressions involving fractional exponents.

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207) Evaluate: $1862.14\left[\frac{1-(1+0.0125)^{-12}}{0.0125}\right]^{-1}$

Answer: $1862.14\left[\frac{1-(1+0.0125)^{-12}}{0.0125}\right]^{-1}$

$= 1862.14\left[\frac{1-(1.0125)^{-12}}{0.0125}\right]^{-1}$

$= 1862.14\left[\frac{0.1385}{0.0125}\right]^{-1}$

$= 1862.14[11.07931]^{-1}$

$= 168.07$

Diff: 2 Type: SA Page Ref: 59-62
Topic: 2.3 Fractional Exponents
Objective: 2-3: Use an electronic calculator to compute the numerical value of arithmetic expressions involving fractional exponents.

208) Evaluate: $\$5000\left[\frac{1-(1+0.05)^{-1000}}{0.05}\right]$

Answer: $\$5000\left[\frac{1-(1+0.05)^{-1000}}{0.05}\right]$

$= \frac{\$5000}{0.05} = \$100{,}000$

Diff: 1 Type: SA Page Ref: 59-62
Topic: 2.3 Fractional Exponents
Objective: 2-3: Use an electronic calculator to compute the numerical value of arithmetic expressions involving fractional exponents.

209) Evaluate: $\frac{ln\left(1+\frac{0.0064\times 100000}{250}\right)}{ln(1.0064)}$

Answer: $\frac{ln\left(1+\frac{0.0064\times 100000}{250}\right)}{ln(1.0064)}$

$= \frac{1.26976}{0.00638}$

$= 199$

Diff: 2 Type: SA Page Ref: 59-62
Topic: 2.3 Fractional Exponents
Objective: 2-3: Use an electronic calculator to compute the numerical value of arithmetic expressions involving fractional exponents.

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210) Evaluate: $\dfrac{27370}{\left[\dfrac{1-(1+0.005)^{-30}}{0.005}\right](1+0.005)}$

Answer: $\dfrac{27370}{\left[\dfrac{1-(1+0.005)^{-30}}{0.005}\right](1+0.005)}$

$= \dfrac{27370}{27.794 \times 1.005}$

= 979.84

Diff: 2 Type: SA Page Ref: 59-62

Topic: 2.3 Fractional Exponents

Objective: 2-3: Use an electronic calculator to compute the numerical value of arithmetic expressions involving fractional exponents.

211) Simplify: $(a + b + c)(a^2 + b^2 + c^2 - ab - bc - ca)$

Answer: $(a + b + c)(a^2 + b^2 + c^2 - ab - bc - ca)$

$= a(a^2 + b^2 + c^2 - ab - bc - ca) + b(a^2 + b^2 + c^2 - ab - bc - ca) + c(a^2 + b^2 + c^2 - ab - bc - ca)$

$= a^3 + ab^2 + ac^2 - a^2b - abc - ca^2 + ba^2 + b^3 + bc^2 - ab^2 - b^2c - abc + ca^2 + b^2c + c^3 - abc - bc^2 - ac^2$

$= a^3 + b^3 + c^3 - 3abc$

Diff: 2 Type: SA Page Ref: 44-49

Topic: 2.1 Simplification of Algebraic Expressions

Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

212) Simplify: $(a + b)^3$

Answer: $(a + b)^3$

$= (a + b)(a + b)^2$

$= (a + b)(a^2 + 2ab + b^2)$

$= a^3 + 3a^2b + 3ab^2 + b^3$

Diff: 1 Type: SA Page Ref: 44-49

Topic: 2.1 Simplification of Algebraic Expressions

Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

213) Simplify: $7x - (5x - 4y) - (6x + 8y - 5x)$

A) x - 4y

B) 11x - 12y

C) x + 12y

D) 3x + 12y

E) 3x - 4y

Answer: A

Diff: 1 Type: MC Page Ref: 44-49

Topic: 2.1 Simplification of Algebraic Expressions

Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

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214) Simplify: x - 2y - [4x - 6y - {3x - z + 2(2x - 4y + z)}]
Answer: x - 2y - [4x - 6y - {3x - z + 2(2x - 4y + z)}]
= x - 2y - [4x - 6y - {3x - z + 4x - 8y + 2z}]
= x - 2y - [4x - 6y - {7x + z - 8y}]
= x - 2y - [4x - 6y - 7x - z + 8y]
= x - 2y - [-3x + 2y - z]
= x - 2y + 3x - 2y + z
= 4x - 4y + z
Diff: 2 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

215) Solve: 2x + 5 = 7
A) x = 1
B) x = 6
C) x = 2
D) x = 4
E) $x = \frac{1}{2}$
Answer: A
Diff: 1 Type: MC Page Ref: 71-75
Topic: 2.5 Solving Basic Equations
Objective: 2-5: Solve basic equations using addition, subtraction, multiplication, and division.

216) Solve: 8x - 11 = 5x + 4
A) $x = -\frac{7}{3}$
B) $x = -\frac{7}{13}$
C) x = 5
D) x = 15
E) x = 4
Answer: C
Diff: 1 Type: MC Page Ref: 71-75
Topic: 2.5 Solving Basic Equations
Objective: 2-5: Solve basic equations using addition, subtraction, multiplication, and division.

217) Solve: 0.5x - 0.75 + 9x = 5x + 1.5
A) x = 0.05
B) x = 0.155
C) x = -0.5
D) x = 0.5
E) x = 0.55
Answer: D
Diff: 1 Type: MC Page Ref: 71-75
Topic: 2.5 Solving Basic Equations
Objective: 2-5: Solve basic equations using addition, subtraction, multiplication, and division.

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218) Solve: y = 192 + 0.04y
A) y = 184.62
B) y = 192
C) y = 200
D) y = 320
E) y = 137.14
Answer: C
Diff: 1 Type: MC Page Ref: 71-75
Topic: 2.5 Solving Basic Equations
Objective: 2-5: Solve basic equations using addition, subtraction, multiplication, and division.

219) Solve and find the value of a, given 3a + 4(15-2a) = 20
A) a = $\frac{16}{3}$

B) a = 7
C) a = 5
D) a = -1
E) a = 8
Answer: E
Diff: 2 Type: MC Page Ref: 71-75
Topic: 2.5 Solving Basic Equations
Objective: 2-5: Solve basic equations using addition, subtraction, multiplication, and division.

220) Solve and find the value of y, given 3(1-2y) + 5y = 5
Answer: 3(1-2y) + 5y = 5
⇒ -y + 3 = 5
⇒ y = -2
Diff: 1 Type: SA Page Ref: 71-75
Topic: 2.5 Solving Basic Equations
Objective: 2-5: Solve basic equations using addition, subtraction, multiplication, and division.

221) Solve: $\frac{x}{1+0.11\times\frac{175}{365}}+2x\left[1+0.11\times\frac{190}{365}\right]=\$115.10$

Answer: $\frac{x}{1+0.11\times\frac{175}{365}}+2x\left[1+0.11\times\frac{190}{365}\right]=\$115.10$

$\Rightarrow \frac{x}{1.05274}+2.11452x=\$115.10$

⇒ 3.06442x = $115.10
⇒ x = $37.56
Diff: 2 Type: SA Page Ref: 76-79
Topic: 2.6 Solving Equations Involving Algebraic Simplification
Objective: 2-6: Solve equations involving algebraic simplification and formula rearrangement.

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222) Solve: $x\left[1 + 0.09 \times \frac{180}{365}\right] + 2x\left[1 + 0.09 \times \frac{85}{365}\right]^{-1} = \$2551.65$

Answer: $1.04438x + 2x(1.02096)^{-1} = \$2551.65$
$\Rightarrow 1.04438x + 1.95894x = \$2551.65$
$\Rightarrow x = \$849.61$
Diff: 2 Type: SA Page Ref: 76-79
Topic: 2.6 Solving Equations Involving Algebraic Simplification
Objective: 2-6: Solve equations involving algebraic simplification and formula rearrangement.

223) Solve: $x(1.05)^3 + \$1000 + \frac{x}{1.05^7} = \frac{\$13000}{1.05^2}$

Answer: $1.157625x + 0.710681x = \$11791.38 - \$1000$
$\Rightarrow x = \frac{\$10791.38}{1.868306}$

$\Rightarrow x = \$5776.02$
Diff: 1 Type: SA Page Ref: 76-79
Topic: 2.6 Solving Equations Involving Algebraic Simplification
Objective: 2-6: Solve equations involving algebraic simplification and formula rearrangement.

224) Solve and find the value of x, given: $\frac{3\left[x - \frac{38 - x}{5}\right]}{5} = \frac{3x - 2\left[\frac{38 - x}{5}\right]}{8}$

A) x = 20
B) x = -9
C) x = 9.02
D) -17.16
E) 4.33
Answer: C
Diff: 2 Type: MC Page Ref: 76-79
Topic: 2.6 Solving Equations Involving Algebraic Simplification
Objective: 2-6: Solve equations involving algebraic simplification and formula rearrangement.

225) Luxury furniture is promoting a no HST (13%) event for the fall sale. What is the actual selling price for the Sofa before tax shown on your receipt, if the ticket price of the sofa is $795.00?
A) $795.00
B) $6,115.38
C) $103.35
D) $898.35
E) $703.54
Answer: E
Diff: 1 Type: MC Page Ref: 81-84
Topic: 2.7 Solving Word Problems
Objective: 2-7: Solve word problems by creating and solving equations.

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226) Sobeys sells fruit trays consisting of pineapple and melons. The manager of the fruit department obtains pineapples at a wholesale price of $2.50 per kg, and melons at $1.85 per kg. He is required to produce 10 kg of the mixed fruit. What is the maximum weight of pineapple that he can put in the mix in order to have an effective wholesale cost no greater than $2.00 per kg?
A) 2.31 kg
B) 7.69 kg
C) 4.56 kg
D) 4 kg
E) 5.41 kg
Answer: A
Diff: 2 Type: MC Page Ref: 81-84
Topic: 2.7 Solving Word Problems
Objective: 2-7: Solve word problems by creating and solving equations.

227) Sobeys sells fruit trays consisting of pineapple and melons. The manager of the fruit department obtains pineapples at a wholesale price of $2.50 per kg, grapes at $2.15 per kg, strawberries at $1.50 per kg and melons at $1.85 per kg. He is required to produce 10 kg of the mixed fruit. He is required to add 2 kg of strawberries and 3 kg of grapes. What is the maximum weight of pineapple that he can put in the mix in order to have an effective wholesale cost no greater than $2.00 per kg?
Answer: Cost of 2 kg of strawberries = $1.50 × 2 = $3.00
Cost of 3 kg of grapes = $2.15 × 3 = $6.45
Total cost of the mixed fruit = $2 × 10 = $20
Cost of pineapple and melons = $20 - ($3 + $6.45) = $10.55 ⇒ 2.5p + 1.85m = 10.55
Maximum weight of pineapple and melons = 10 - (2 + 3) = 5kg
∴ 2.5p + 1.85(5-p) = 10.55
⇒ 0.65p + 9.25 = 10.55
⇒ $p = \frac{10.55-9.25}{0.65} = 2$

∴ Maximum weight of pineapple = 2 kg
Diff: 2 Type: SA Page Ref: 81-84
Topic: 2.7 Solving Word Problems
Objective: 2-7: Solve word problems by creating and solving equations.

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228) ABC financial has introduced a stock option incentive program. For a total of 301,375 options, each of the 3 executives receives twice as many options as the senior managers. Each senior manager receives twice the options as each of the middle managers and each of the middle managers receives 1.5 times the options as each of the employee. If there are 25 senior managers, 75 middle managers and 1000 employees, how many options will the each executive receive?
A) 250
B) 375
C) 750
D) 1500
E) 4500
Answer: D
Diff: 2 Type: MC Page Ref: 81-84
Topic: 2.7 Solving Word Problems
Objective: 2-7: Solve word problems by creating and solving equations.

229) Sleep Inc. reduced the price of the Sealy mattress by 20% for a spring sale. What was the regular price of the mattress, if the sale price is $649.95?
A) $129.99
B) $779.94
C) $3,249.75
D) $812.44
E) $649.95
Answer: D
Diff: 1 Type: MC Page Ref: 81-84
Topic: 2.7 Solving Word Problems
Objective: 2-7: Solve word problems by creating and solving equations.

230) Blue Mountain resort charges $39 for a single ticket for high ropes and $29 for a single ticket for low ropes. If a day's total revenue from the sale of 540 passes is $18,910, how many tickets were sold for high ropes?
Answer: $39HR + 29(540 - HR) = 18910$

$\Rightarrow$ $HR = \frac{18910 - 29 \times 540}{39 - 29} = 325$

325 tickets were sold for high ropes
Diff: 3 Type: SA Page Ref: 81-84
Topic: 2.7 Solving Word Problems
Objective: 2-7: Solve word problems by creating and solving equations.

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231) Age difference between my son and me is 30 years. Sum of our ages is 54. What is my age now?
A) 12
B) 42
C) 38
D) 45
E) 15
Answer: B
Diff: 1 Type: MC Page Ref: 81-84
Topic: 2.7 Solving Word Problems
Objective: 2-7: Solve word problems by creating and solving equations.

232) Transpipe owns 47% ownership stake in BP. Cameo owns a 29% stake in the BP. Suppose Transpipe sells 62.5% of its stake for $47 Million. If Comeo uses that transaction as the basis for calculating the value of its own 29% position, what value will Cameo obtain?
A) $18.1 Million
B) $46.4 Million
C) $16 Million
D) $47 Million
E) $29 Million
Answer: B
Diff: 2 Type: MC Page Ref: 81-84
Topic: 2.7 Solving Word Problems
Objective: 2-7: Solve word problems by creating and solving equations.

233) Simplify: $-(3a + 7ab - 5) - (12 + 6ab - 5a)$
Answer: $= -3a - 7ab + 5 - 12 - 6ab + 5a = 2a - 13ab - 7$
Diff: 4 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

234) Simplify: $(x + 4)(2x^2 - 9x + 3)$
Answer: $2x^3 - 9x^2 + 3x + 8x^2 - 36x + 12 = 2x^3 - x^2 - 33x + 12$
Diff: 4 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

235) Simplify: $-3w(4z + 1) - 2z(6w + 2)$
Answer: $-12wz - 3w + 24wz - 8z = -3w + 12wz - 8z$
Diff: 3 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

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236) Solve: $\frac{1}{3}(6x^2 + x - 1) - \frac{1}{2}(2x^2 - 12x + 4)$ for $x = 7$

Answer: $\frac{1}{3}[6(7)^2 + 7 - 1] - \frac{1}{2}[2(7)^2 - 12(7) + 4]$

$= \frac{1}{3}(294 + 7 — 1) - \frac{1}{2}(98 - 84 + 4)$

$= \frac{1}{3}(300) - \frac{1}{2}(18)$

$= 91$

Diff: 3 Type: SA Page Ref: 44-49
Topic: 2.1 Simplification of Algebraic Expressions
Objective: 2-1: Simplify algebraic expressions using fundamental operations and substitution.

237) Simplify: $2^9 \div 2^3 \times 2^4$

A) 2^2
B) 2^8
C) 2^7
D) 2^{10}

Answer: D
Diff: 2 Type: MC Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

238) Simplify: $\left(\frac{1}{8}\right)^5 \div \left(\frac{1}{8}\right)^2 \div \frac{1}{8}$

Answer: $\left(\frac{1}{8}\right)^{(5-2-1)} = \left(\frac{1}{8}\right)^2 = \frac{1}{64}$

Diff: 3 Type: SA Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

239) Expand: $(3xyz)^3$

Answer: $3^3x^3y^3z^3 = 27x^3y^3z^3$

Diff: 3 Type: SA Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

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240) Solve: $635241(1093)^0$
Answer: $635241(1093)^0$
$= 635241 \times 1$
$= 635241$
Diff: 2 Type: SA Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

241) Simplify: $\left[\frac{x}{(x+2)}\right]^{-2}$
Answer: $\left[\frac{x}{(x+2)}\right]^{-2}$
$= (x + 2)2/ x^2$
$= (x^2 + 4x + 4)/ x^2$
$= 1 + (4/x) + (4/x^2)$
Diff: 4 Type: SA Page Ref: 51-58
Topic: 2.2 Integral Exponents
Objective: 2-2: Simplify and evaluate powers with positive exponents, negative exponents, and exponent zero.

242) Calculate: $\sqrt{4489}$
Answer: 67
Diff: 2 Type: SA Page Ref: 59-62
Topic: 2.3 Fractional Exponents
Objective: 2-3: Use an electronic calculator to compute the numerical value of arithmetic expressions involving fractional exponents.

243) Calculate: $\sqrt[4]{1296}$
Answer: 6
Diff: 3 Type: SA Page Ref: 59-62
Topic: 2.3 Fractional Exponents
Objective: 2-3: Use an electronic calculator to compute the numerical value of arithmetic expressions involving fractional exponents.

244) Calculate up to 4 decimals: $\sqrt[7]{4321}$
Answer: 3.3065
Diff: 3 Type: SA Page Ref: 59-62
Topic: 2.3 Fractional Exponents
Objective: 2-3: Use an electronic calculator to compute the numerical value of arithmetic expressions involving fractional exponents.

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245) Calculate: $(5489031744)^{1/6}$
Answer: 42
Diff: 4 Type: SA Page Ref: 59-62
Topic: 2.3 Fractional Exponents
Objective: 2-3: Use an electronic calculator to compute the numerical value of arithmetic expressions involving fractional exponents.

246) Calculate with final answer in fractional form: $390625^{-1/8}$
Answer: $\frac{1}{5}$

Diff: 4 Type: SA Page Ref: 59-62
Topic: 2.3 Fractional Exponents
Objective: 2-3: Use an electronic calculator to compute the numerical value of arithmetic expressions involving fractional exponents.

247) Calculate up to 4 decimals: $4826809^{1/6}$
Answer: 13
Diff: 4 Type: SA Page Ref: 59-62
Topic: 2.3 Fractional Exponents
Objective: 2-3: Use an electronic calculator to compute the numerical value of arithmetic expressions involving fractional exponents.

248) Express in logarithmic form: $8^{-3} = \frac{1}{512}$

Answer: $\log_8 \frac{1}{512} = -3$

Diff: 3 Type: SA Page Ref: 63-67
Topic: 2.4 Logarithms - Basic Aspects
Objective: 2-4: Write exponential equations in logarithmic form and use an electronic calculator equipped with a natural logarithm function to determine the value of natural logarithms.

249) Express in logarithmic form: $e^{4x} = 20$
Answer: $4x = \ln 20$
$x = \ln 20^{\frac{1}{4}}$

Diff: 4 Type: SA Page Ref: 63-67
Topic: 2.4 Logarithms - Basic Aspects
Objective: 2-4: Write exponential equations in logarithmic form and use an electronic calculator equipped with a natural logarithm function to determine the value of natural logarithms.

250) Express in exponential form: $\log_3(243) = 5$

Answer: $3^5 = 243$
Diff: 2 Type: SA Page Ref: 63-67
Topic: 2.4 Logarithms - Basic Aspects
Objective: 2-4: Write exponential equations in logarithmic form and use an electronic calculator equipped with a natural logarithm function to determine the value of natural logarithms.

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251) Express in exponential form: $\log_{-4}(4096) = 6$

Answer: $(-4)^6 = 4096$
Diff: 3 Type: SA Page Ref: 63-67
Topic: 2.4 Logarithms - Basic Aspects
Objective: 2-4: Write exponential equations in logarithmic form and use an electronic calculator equipped with a natural logarithm function to determine the value of natural logarithms.

252) Calculate up to 4 decimal places: ln 16
Answer: 2.7726
Diff: 3 Type: SA Page Ref: 63-67
Topic: 2.4 Logarithms - Basic Aspects
Objective: 2-4: Write exponential equations in logarithmic form and use an electronic calculator equipped with a natural logarithm function to determine the value of natural logarithms.

253) Calculate up to 4 decimal places: $\ln [400(\frac{1.5}{45})]$

Answer: 2.5903
Diff: 5 Type: SA Page Ref: 63-67
Topic: 2.4 Logarithms - Basic Aspects
Objective: 2-4: Write exponential equations in logarithmic form and use an electronic calculator equipped with a natural logarithm function to determine the value of natural logarithms.

254) Solve for x: $x + 14 = -7$
Answer: $x = -7 - 14 = -21$
Diff: 2 Type: SA Page Ref: 71-75
Topic: 2.5 Solving Basic Equations
Objective: 2-5: Solve basic equations using addition, subtraction, multiplication, and division.

255) Solve for x: $-5x = 8 - 4x$
Answer: $-4x + 5x = 8$
$x = 8$
Diff: 2 Type: SA Page Ref: 71-75
Topic: 2.5 Solving Basic Equations
Objective: 2-5: Solve basic equations using addition, subtraction, multiplication, and division.

256) Solve for x: $2x - 1.5x = 410$
Answer: $0.5x = 410$
$x = 820$
Diff: 3 Type: SA Page Ref: 71-75
Topic: 2.5 Solving Basic Equations
Objective: 2-5: Solve basic equations using addition, subtraction, multiplication, and division.

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257) Solve for x: $-\frac{1}{7}x = 8$

Answer: $(-7) - \frac{1}{7}x = 8(-7)$

$x = -56$
Diff: 3 Type: SA Page Ref: 71-75
Topic: 2.5 Solving Basic Equations
Objective: 2-5: Solve basic equations using addition, subtraction, multiplication, and division.

258) Solve for x: $-6x = 486 + 3x$
Answer: $-9x = 486$
$x = -54$
Diff: 3 Type: SA Page Ref: 71-75
Topic: 2.5 Solving Basic Equations
Objective: 2-5: Solve basic equations using addition, subtraction, multiplication, and division.

259) Solve for x and check your answer: $8x + 14 = 12x + 22$
Answer: $14 - 22 = 12x - 8x$
$-8 = 4x$
$-2 = x$
Check:
$8(-2) + 14 = 12(-2) + 22$
$-16 + 14 = -24 + 22$
$-2 = -2$
Diff: 4 Type: SA Page Ref: 71-75
Topic: 2.5 Solving Basic Equations
Objective: 2-5: Solve basic equations using addition, subtraction, multiplication, and division.

260) Solve for x: $2x + 4(5x - 3) = -7(2 + x) - (-11x - 11)$
Answer: $2x + 20x - 12 = -14 - 7x + 11x + 11$
$22x - 4x = -3 + 12$
$18x = 9$
$x = 0.5$
Diff: 3 Type: SA Page Ref: 76-79
Topic: 2.6 Solving Equations Involving Algebraic Simplification
Objective: 2-6: Solve equations involving algebraic simplification and formula rearrangement.

261) Solve for x: $\frac{5}{2}x - \frac{3}{4}x = \frac{14}{8}$

Answer: $(8)\frac{5}{2}x - (8)\frac{3}{4}x = (8)\frac{14}{8}$

$4(5x) - 2(3x) = 14$
$14x = 14$
$x = 1$
Diff: 3 Type: SA Page Ref: 76-79
Topic: 2.6 Solving Equations Involving Algebraic Simplification
Objective: 2-6: Solve equations involving algebraic simplification and formula rearrangement.

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262) Solve for x: $x + \frac{3}{8}x = 22$

Answer: $(8)x + (8)\frac{3}{8}x = (8)22$

$11x = 176$
$x = 16$
Diff: 2 Type: SA Page Ref: 76-79
Topic: 2.6 Solving Equations Involving Algebraic Simplification
Objective: 2-6: Solve equations involving algebraic simplification and formula rearrangement.

263) Solve for x (answer will be a decimal) $\frac{5}{6}(x + 2) - \frac{1}{3}(2x + 2) =$

Answer: $(24)\frac{5}{6}(x + 2) -(24)\frac{1}{3}(2x + 2) = (24)\frac{2}{8}$

$(4)(5)(x + 2) — 8(2x + 2) = 3(2)$
$20(x + 2) — (16x - 16) = 6$
$4x = -50$
$x = 12.5$
Diff: 4 Type: SA Page Ref: 76-79
Topic: 2.6 Solving Equations Involving Algebraic Simplification
Objective: 2-6: Solve equations involving algebraic simplification and formula rearrangement.

264) Rearrange for r: $A = \pi r^2$
Answer: $\frac{A}{\pi} = r^2$

$\sqrt{\frac{A}{\pi}} = r$
Diff: 3 Type: SA Page Ref: 76-79
Topic: 2.6 Solving Equations Involving Algebraic Simplification
Objective: 2-6: Solve equations involving algebraic simplification and formula rearrangement.

265) Rearrange for b: $a^2 + b^2 = c^2$
Answer: $b^2 = c^2 + a^2$
$b = \sqrt{(c^2 + a^2)}$
Diff: 3 Type: SA Page Ref: 76-79
Topic: 2.6 Solving Equations Involving Algebraic Simplification
Objective: 2-6: Solve equations involving algebraic simplification and formula rearrangement.

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266) Rearrange for c: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Answer: $2ax = -b \pm \sqrt{(b^2 - 4ac)}$
$2ax + b = \sqrt{(b2 - 4ac)}$
$(2ax + b)^2 = b^2 - 4ac$
$4a^2x2 + 4abx + b^2 = b^2 - 4ac$
$4a^2x2 + 4abx + b^2 - b^2 = -4ac$
$-4a^2x2 - 4abx = 4ac$
$\frac{-4a^2x^2}{4a} - \frac{-4abx}{4a} = \frac{4ac}{4a}$

$-ax^2 - bx = c$
Diff: 5 Type: SA Page Ref: 76-79
Topic: 2.6 Solving Equations Involving Algebraic Simplification
Objective: 2-6: Solve equations involving algebraic simplification and formula rearrangement.

267) A smartphone was being sold for $660 while on sale. If the price dropped by 20% for the sale, what was the original price of the smartphone?
Answer: Let x represent the original smartphone's price
Since a 20% drop in price equates to $\frac{1}{5}$, $(x - \frac{1}{5}x)$ can represent the sale price

$x - \frac{1}{5}x = 660$

$\frac{4}{5}x = 660$

$x = \frac{5}{4}(660)$

$x = 825$
Diff: 3 Type: SA Page Ref: 81-84
Topic: 2.7 Solving Word Problems
Objective: 2-7: Solve word problems by creating and solving equations.

268) Carlos went to the mall to buy toys for his children and nephews with a total of $1300. After he was done shopping, he had $400 left in his account. Carlos's expenditure on doll sets was $100 less than four times the amount he spent on toy cars. How much money did Carlos spend on doll sets?
Answer: Let x represent Carlos's expenditure on toy cars. Consequently, the expenditure on doll sets can be represented with the expression 4x - 100. Since Carlos started with $1300 and was left with $400, we can assume he spent $900 at the mall. From this info, we can create the equation:
$x + 4x - 100 = 900$
$5x = 1000$
$x = 200$
Diff: 4 Type: SA Page Ref: 81-84
Topic: 2.7 Solving Word Problems
Objective: 2-7: Solve word problems by creating and solving equations.

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269) Usually, Bob's Burgers sells x burgers for p dollars each. But today, the price was lowered by 22% and as a result, 60% more burgers were sold. Which of the below represents the revenue for today's burger sales, in dollars?
A) $0.6x - 0.22p$
B) $1.15xp$
C) $1.248xp$
D) $1.455xp$
Answer: C
Diff: 2 Type: MC Page Ref: 81-84
Topic: 2.7 Solving Word Problems
Objective: 2-7: Solve word problems by creating and solving equations.

270) Sony has been producing 1710 VR headsets a day through two work shifts. The second shift has produced 90 fewer headsets than seven-fifths of the number of headsets produced by the first shift. What is the number of VR headsets produced by the second shift in a day?
Answer: Let x represent the number of VR headsets produced by the first shift. Consequently, the number of VR headsets made by the second shift can be represented through the expression $\frac{7}{5}x - 90$. Since 1675 headsets are produced daily, the equation formed is:

$$x + \frac{7}{5}x - 90 = 1710$$

$$\frac{12}{5}x = 1620$$

$$x = \frac{5}{12}(1620)$$

$$x = 675$$
Diff: 4 Type: SA Page Ref: 81-84
Topic: 2.7 Solving Word Problems
Objective: 2-7: Solve word problems by creating and solving equations.

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271) Old Navy had $940 worth of orders for shirts. The prices for the shirts were categorized by style: $10 for tank tops, $14 for graphic tees, and $22 for polos. The number of polos ordered was one more than half the number of graphic tees, and the number of graphic tees ordered was eight less than twice the number of tank tops. Determine the number of each type of shirt ordered.
Answer: Let x represent the number of tank tops, let $2x - 8$ represent the number of graphic tees sold, and let $\frac{1}{2}(2x - 8) + 1$ represent the number of polos sold. Taking the price and the value of the combined orders into consideration, the equation is as follows:

$10x + 14(2x - 8) + 22[\frac{1}{2}(2x - 8)] = 940$

$10x + 28x - 112 + 22[x - 4] = 940$
$38x + 22x - 88 = 1052$
$60x = 1140$
$x = 19$
$2(19) - 8 = 30$ Graphic Tees
$\frac{1}{2}2(19) - 8] + 1 = 16$ Polos

Diff: 5 Type: SA Page Ref: 81-84
Topic: 2.7 Solving Word Problems
Objective: 2-7: Solve word problems by creating and solving equations.

272) Zain began with three times more money than Max. After Zain gave Max $18, Zain still had $6 more than Max. How much money do they have altogether?
Answer: Let x represent the amount of money Brock has to start (3x represents Zain)
$2x - 18 = x + 6 + 18$
$2x - 18 = x + 24$
$2x - x = 42$
$x = 42$
$3x = 3(42) = 126$
Diff: 3 Type: SA Page Ref: 81-84
Topic: 2.7 Solving Word Problems
Objective: 2-7: Solve word problems by creating and solving equations.

273) The rapper Drake hosts a concert at the Air Canada Center, where the ticket price is $240. However, the price of the individual ticket includes the 13% HST. What is the original price of the ticket, excluding the HST?
Answer: Let x represent the price of a concert ticket, excluding HST
$1.13x = 240$
$x = \frac{240}{1.13}$

$x = 212.39$
Diff: 2 Type: SA Page Ref: 81-84
Topic: 2.7 Solving Word Problems
Objective: 2-7: Solve word problems by creating and solving equations.

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274) At the beginning of the Toronto FC game, $\frac{2}{3}$ of the stadium's seats were full. At halftime, 1000 spectators left, leaving only $\frac{3}{7}$ of the seats full. In total, how many seats are in the stadium?

Answer: Let x represent the total number of seats in the stadium

$\frac{2}{3}x - 1000 = \frac{3}{7}x$

$\frac{2}{3}x - \frac{3}{7}x = 1000$

$\frac{3}{21}x - \frac{2}{21}x = 1000$

$\frac{1}{21}x = 1000$

$x = 21\ 000$

Diff: 3 Type: SA Page Ref: 81-84
Topic: 2.7 Solving Word Problems
Objective: 2-7: Solve word problems by creating and solving equations.

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