Mathematical Excursions 5th edition Aufmann Test Bank

SKU: 9798214011264-TEST-BANK

Mathematical Excursions (5th)

ISBN 9798214011264 | Chapter 1: Section 1.1 Inductive and Deductive Reasoning

Total Questions: 52

Pool 1

Multiple Choice (19)

Q1. *[Multiple Choice]*

Which two numbers should come next in the sequence?

20, 23, 26, 29, ...

a) 35, 38
b) 31, 34
c) 32, 35 ✓ correct
d) 31, 28

Q2. *[Multiple Choice]*

Find the sixth term in the pattern.

2, 2, 4, 6, 10, ...

a) 60
b) 15
c) 14
d) 16 ✓ correct

Q3. *[Multiple Choice]*

Use inductive reasoning to predict the most probable next number in the given list.

81, 256, 625, 1296,?

a) 7776
b) 2401 ✓ correct
c) 1967
d) 16807
e) 1921

Q4. *[Multiple Choice]*

Use inductive reasoning to predict the most probable next number in the given list.

10, 19, 15, 24, 20, 29,?

a) 38
b) 49
c) 21
d) 12
e) 25 ✓ correct

Mathematical Excursions 5th edition Aufmann Test Bank

Q5. *[Multiple Choice]*

Use inductive reasoning to decide whether the conclusion for the following argument is correct. Pick any counting number. Multiply the number by 6. Subtract 3 from the product. Divide the difference by the sum of the original number and 4. The resulting number is 6.

a) The conclusion is correct.

b) The conclusion is incorrect. ✓ correct

c) There is not enough information to determine the validity of the conclusion.

Q6. *[Multiple Choice]*

Use the data in the table and inductive reasoning to answer the question.

Cube edge lengthWeight of water inside cube
(water fills entire cube)

1 cm
2 cm
3 cm
4 cm1 g
8 g
27 g
64 g

If a cube is filled with water and the weight of the water is 512 grams, what is the edge length of the cube?

a) 171

b) 64

c) 8 ✓ correct

d) 7

Q7. *[Multiple Choice]*

Use inductive reasoning to help complete the table. Round your answers to two decimal places, if necessary.

Number of sides
of a regular polygon45678■
17

Interior angle measure90108120128.57

a) 140, 158.82

b) 135, 382.5

c) 135, 158.82 ✓ correct

d) 140, 382.5

Mathematical Excursions 5th edition Aufmann Test Bank

Q8. *[Multiple Choice]*

Which is a valid conclusion based on the following information? An equilateral triangle has three congruent sides.

Given: ΔABC is equilateral.

a) $\angle ABC$ has a measure between 0° and 30°.
b) $\overleftrightarrow{AB}$ and $\overleftrightarrow{BC}$ are collinear.
c) B is the midpoint of $\overline{AC}$.
d) ΔABC has three congruent sides. ✓ correct

Q9. *[Multiple Choice]*

Alisa reads in a geometry book that two intersecting lines will lie in the same plane. Which statement is correct about the conclusion Alisa can make?

a) She can use deductive reasoning to conclude that if she draws two intersecting lines, the lines will not lie in the same plane.
b) She can use deductive reasoning to conclude that if she draws two intersecting lines, the lines will lie in the same plane. ✓ correct
c) She can use deductive reasoning to conclude that if she draws three intersecting lines, the lines will lie in the same plane.
d) She can use deductive reasoning to conclude that if she draws three intersecting lines, the lines will not lie in the same plane.

Q10. *[Multiple Choice]*

Use the pattern to make a conjecture. Then, use the conjecture to find the next product.

$2 \cdot 8 = 16$
$22 \cdot 8 = 176$
$222 \cdot 8 = 1{,}776$
$2{,}222 \cdot 8 = 17{,}776$

a) The product of a number consisting of $(n - 1)$ 2s and 8 consists of 1, $(n - 1)$ 7s and 6. The next product is 177,776.
b) The product of a number consisting of n 2s and 8 consists of 1, n 7s and 6. The next product is 17,776.
c) The product of a number consisting of $(n - 1)$ 2s and 8 consists of 7, n 7s and 6. The next product is 17,776.
d) The product of a number consisting of n 2s and 8 consists of 1, $(n - 1)$ 7s and 6. The next product is 177,776. ✓ correct

Q11. *[Multiple Choice]*

Find a counterexample to show that $x > \frac{1}{8x}$ is a false statement.

a) choose $x = 8$
b) choose $x = 1$
c) choose ~~$x = 5$~~ $x = \frac{1}{8}$
d) choose $x = \frac{1}{8}$ ✓ correct
e) choose $x = \frac{7}{8}$

Mathematical Excursions 5th edition Aufmann Test Bank

Q12. *[Multiple Choice]*

Find a counterexample to show that $\frac{(x+6)(x-19)}{(x-19)} = (x+6)$ is a false statement.

a) choose x=6
b) choose x=1
c) choose x= –19
d) choose x=–6
e) choose x= 19

✓ correct

Q13. *[Multiple Choice]*

Which choice gives an example that supports the conjecture, and a counterexample respectively, that shows the conjecture is false?

For any real number n, $\sqrt{n^2} = n$.

a) $\sqrt{(3)^2} = 3$, but $\sqrt{(2)^2} = 2$
b) $\sqrt{(-3)^2} = 3$, but $\sqrt{(-2)^2} = 2$
c) $\sqrt{(-9)^2} = 3$, but $\sqrt{(2)^2} = 2$
d) $\sqrt{(3)^2} = 3$, **but** $\sqrt{(-2)^2} = 2$ **✓ correct**

Mathematical Excursions 5th edition Aufmann Test Bank

Q14. *[Multiple Choice]*

Use deductive reasoning to determine the number that will always be produced from the following procedure. Pick a number. Add 6 to the number and multiply the sum by 3. Subtract 2 and then decrease this difference by 3 times the original number.

a) Let n be the original number.

$n + 6$ (add 6)
$n + 18$ (multiply by 3)
$n + 16$ (subtract 2)
$n + 16 - 3 \cdot n$
(decrease by 3 times original number)
13 (final number)

b) Let n be the original number.

$n + 6$ (add 6)
$3 \cdot n + 18$ (multiply by 3)
$1 \cdot n + 16$ (subtract 2)
$1 \cdot n + 16 - 3 \cdot n$ (decrease by 3times original number)
14 (final number)

c) Let n be the original number.

$n + 6$ (add 6)
$3 \cdot n + 18$ (multiply by 3)
$3 \cdot n + 16$ (subtract 2)
$3 \cdot n + 16 - 3 \cdot n$ (decrease by 3times original number)
16 (final number)
✓ correct

d) Let n be the original number.

$6 \cdot n$ (add 6)
$18 \cdot n$ (multiply by 3)
$16 \cdot n$ (subtract 2)
$16 \cdot n - 3 \cdot n$ (decrease by 3times original number)
$13 \cdot n$ (final number)

e) Let n be the original number.

$n + 6 \cdot n$ (add 6)
$3 \cdot n + 18 \cdot n$ (multiply by 3)
$3 \cdot n + 16 \cdot n$ (subtract 2)
$3 \cdot n + 16 \cdot n - 3 \cdot n$ (decrease by 3times original number)
$16 \cdot n$ (final number)

Q15. *[Multiple Choice]*

A number is divisible by 6 if the sum of the digits of the number is divisible by 3 and the number is even. Which statement is correct about the conclusion that can be made?

a) Deductive reasoning can be used to determine that 156,090 is divisible by 6. ✓ correct

b) Inductive reasoning can be used to determine that 156,090 is not divisible by 6.

c) Inductive reasoning can be used to determine that 156,090 is divisible by 6.

d) Deductive reasoning can be used to determine that 156,090 is not divisible by 6.

Mathematical Excursions 5th edition Aufmann Test Bank

Q16. *[Multiple Choice]*

Three boys are in three different rooms. Ernest always tells the truth. Barry sometimes tells the truth. Mario never tells the truth. Use the statements made by the person in each room to tell who is in each of the rooms.

Room 1Room 2Room 3
The guy in Room 2 is Mario.I'm Barry.The guy in Room 2 is Ernest.

a) Room 1 - Mario; Room 2 - Barry; Room 3 - Ernest
b) Room 1 - Ernest; Room 2 - Mario; Room 3 - Barry ✓ correct
c) Room 1 - Barry; Room 2 - Ernest; Room 3 - Mario
d) Room 1 - Mario; Room 2 - Ernest; Room 3 - Barry

Q17. *[Multiple Choice]*

All octagons have exactly eight sides. Figure A is an octagon. Therefore, Figure A has exactly eight sides.

Determine whether this argument is an example of inductive reasoning or deductive reasoning.

a) The argument reaches a conclusion based on specific examples, so it is an example of inductive reasoning.
b) The conclusion is a specific case of a general assumption, so it is an example of deductive reasoning. ✓ correct
c) The argument observes patterns across many octagons and draws a general conclusion, so it is an example of inductive reasoning.
d) The conclusion is a general rule derived from specific observations, so it is an example of deductive reasoning.
e) The argument is based on probability and past observations of figures, so it is an example of inductive reasoning.

Q18. *[Multiple Choice]*

Calvin, Joe, Glen, and Alwin recently registered to attend a "Clutch and Caffeine" professional networking program. The four attendees hold different positions - Doctor, Engineer, Manager, and Director. Using the following clues, determine which position each person holds.
1. Glen earns more than the Doctor but less than the Director.
2. Calvin and the Engineer are the same age, and they are the youngest members of the group.
3. Joe and the Engineer are brothers.
4. Glen is not the Engineer.

Which of the following correctly matches each person to their position?

a) Calvin – Engineer, Joe – Doctor, Glen – Director, Alwin – Manager
b) Calvin – Engineer, Joe – Manager, Glen – Doctor, Alwin – Director
c) Calvin – Doctor, Joe – Director, Glen – Manager, Alwin – Engineer ✓ correct
d) Calvin – Manager, Joe – Engineer, Glen – Director, Alwin – Doctor
e) Calvin – Director, Joe – Engineer, Glen – Doctor, Alwin – Manager

Mathematical Excursions 5th edition Aufmann Test Bank

Q19. *[Multiple Choice]*

Each of four colleagues, Marcus, Diana, Leo, and Priya, has a different job role (Designer, Accountant, Developer, or Analyst). Using the following clues, determine the job role of each colleague.

1. Marcus arrives at the office after the Accountant but before the Analyst.
2. Priya, who is the last to arrive at the office, is not the Designer.
3. The Analyst and Priya start their shift at the same time.
4. The Accountant lives next door to Leo.
5. Marcus is not the Designer.

Which of the following correctly matches each colleague to their job role?

a) Marcus –Accountant, Diana –Designer, Leo –Analyst, Priya –Developer
b) Marcus – Developer, Diana –Accountant, Leo –Designer, Priya –Analyst ✓ correct
c) Marcus –Designer, Diana –Accountant, Leo –Developer, Priya –Analyst
d) Marcus –Analyst, Diana –Developer, Leo –Accountant, Priya –Designer
e) Marcus –Developer, Diana –Designer, Leo –Accountant, Priya –Analyst

Fill in the Blank (2)

Q20. *[Fill in the Blank]*

What is the missing number in the sequence below?

$\frac{1}{2}$, 1,$\frac{3}{2}$,?,$\frac{5}{2}$, ...

Q21. *[Fill in the Blank]*

Use inductive reasoning to predict the most probable next letter in the list. . . . , H, I, M, N, R, S, . . .

Pool 2

Multiple Choice (4)

Q22. *[Multiple Choice]*

The fuel efficiency of a motorcycle is 53 kilometers per liter.About how many liters of fuel are required for a trip of 366 kilometers?

(To estimate, round to the nearest convenient numbers.)

a) Approximately 8 liters
b) Approximately6liters
c) Approximately 7 liters ✓ correct
d) Approximately9liters
e) Approximately5liters

Mathematical Excursions 5th edition Aufmann Test Bank

Q23. *[Multiple Choice]*

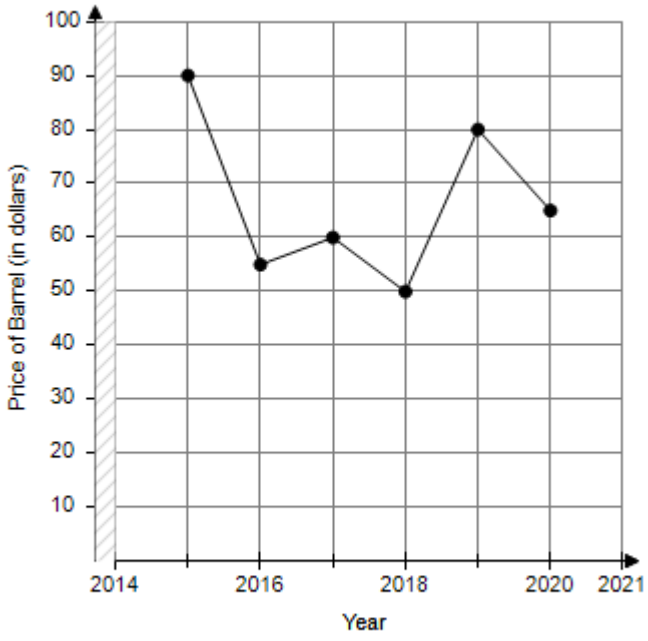
A school teacher wants to take a class of 47 students on a picnic. If the teacher estimates the average spending per student on food and drinks at $6.75, what is the approximate total cost of the picnic?

(To estimate, round to the nearest convenient numbers.)

a) The approximate cost is $320.
b) The approximate cost is $329.
c) The approximate cost is $350. ✓ correct
d) The approximate cost is $365.
e) The approximate cost is $450.

Q24. *[Multiple Choice]*

The broken-line graph shows the closing price of one barrel of crude oil (in dollars) at the end of each year for selected years.



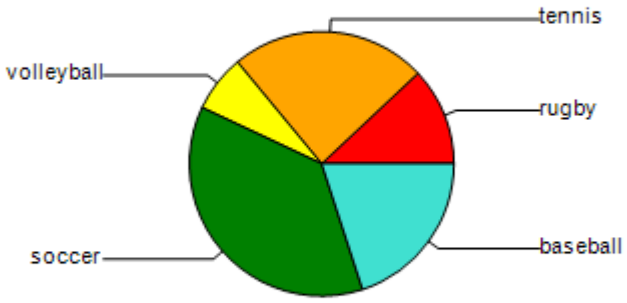
For the years shown, was the price of one barrel of crude oil ever more than $80? Did the price of one barrel of crude oil increase or decrease between 2017 and2018?

a) Yes, the price was more than $80 in 2015, andbetween2017and2018, it decreased. ✓ correct
b) Yes, the price was more than $80 in 2015, andbetween2017and2018, it increased.
c) No, the price was never more than $80, andbetween2017and2018, the price decreased.
d) No, the price was never more than $80, andbetween2017and2018, the price increased.

Mathematical Excursions 5th edition Aufmann Test Bank

Q25. *[Multiple Choice]*

The circle graph shows the distribution of students' favorite sports.



Which sport did students like the most, and which did they like the least?

a) Students liked soccer the most and volleyball the least. ✓ correct
b) Students liked volleyball the most and soccer the least.
c) Students liked soccer the most and rugby the least.
d) Students liked rugby the most and soccer the least.

Pool 3

Multiple Choice (14)

Q26. *[Multiple Choice]*

Construct a difference table to predict the next term of the sequence
8, 28, 60, 104, 160, ...

a) 52
b) 12
c) 264
d) 216
e) 228 ✓ correct

Q27. *[Multiple Choice]*

Construct a difference table to predict the next term of the sequence.
–50, –68, –78, –80, –74, –60, ...

a) –28
b) –38 ✓ correct
c) –154
d) –68
e) 8

Mathematical Excursions 5th edition Aufmann Test Bank

Q28. *[Multiple Choice]*

Compute the first five terms of the sequence with nth term formula given by $a_n = 9n^3 - 7n^2$ (Assume that n begins with 1.)

a) 2, 44, 180, 464, 950 ✓ correct

b) 2, 4, 8, 16, 32

c) 2, 4, 6, 8, 10

d) 6, 12, 24, 48, 96

e) 2, 44, 86, 128, 170

Q29. *[Multiple Choice]*

Write the first five terms of the sequence. (Assume that n begins with 1.)

$a_n = 7n - 5$

a) 12, 19, 26, 33, 40

b) –5, 2, 9, 16, 23

c) 2, 14, 21, 28, 35

d) 2, 9, 16, 23, 30 ✓ correct

e) 2, –3, –8, –13, –18

Q30. *[Multiple Choice]*

Find the indicated term of the sequence whose nth term is given by the formula.

$$a_n = \frac{n^2}{2n-3}$$

; a_4?

a) $\frac{16}{11}$

b) $\frac{16}{5}$ **✓ correct**

c) 4

d) $\frac{8}{5}$

Q31. *[Multiple Choice]*

Find the indicated term of the sequence whose nth term is given by the formula.

$$a_n = \frac{n^2}{n+6}$$

; a_3?

a) 3

b) 1 **✓ correct**

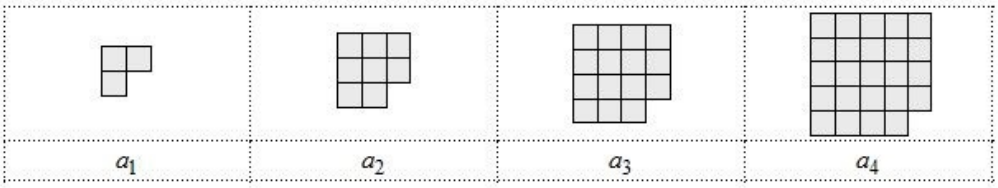
c) $\frac{2}{3}$

d) $\frac{1}{2}$

Mathematical Excursions 5th edition Aufmann Test Bank

Q32. *[Multiple Choice]*

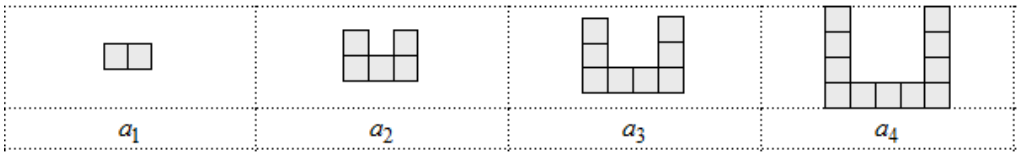
Determine the nth term formula for the number of square tiles that will be in the nth figure.



a) $a_n = n^2 + 1$
b) $a_n = 3n$
c) $a_n = n + 2$
d) $\boldsymbol{a_n = n^2 + 2n}$ **✓ correct**
e) $a_n = 3n - 1$

Q33. *[Multiple Choice]*

Determine the nth term formula for the number of square tiles that will be in the nth figure.



a) $a_n = n^2 + 1$
b) $a_n = 2n$
c) $a_n = n + 1$
d) $\boldsymbol{a_n = 3n - 1}$ **✓ correct**
e) $a_n = 2n - 1$

Q34. *[Multiple Choice]*

Determine the nth term formula for the number of square tiles that will be in the nth figure.

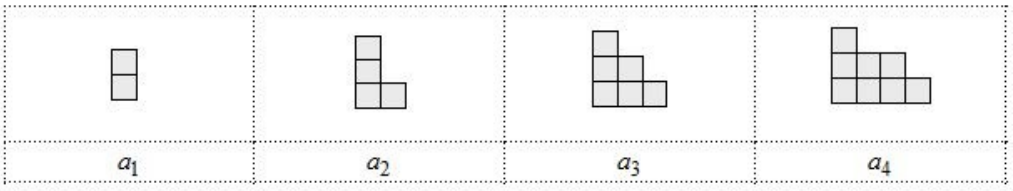


a) $a_n = n^2 - 1$
b) $a_n = 2n$
c) $a_n = n + 1$
d) $\boldsymbol{a_n = n^2 + 1}$ **✓ correct**
e) $a_n = 2n - 1$

Mathematical Excursions 5th edition Aufmann Test Bank

Q35. *[Multiple Choice]*

Determine the nth term formula for the number of square tiles that will be in the nth figure.



a) $a_n = n^2 + 1$
b) $a_n = 3n$
c) $a_n = n + 1$
d) $\boldsymbol{a_n = 2n}$ **✓ correct**
e) $a_n = 3n - 1$

Q36. *[Multiple Choice]*

Find the first five terms of the sequence.

$a_0 = 5$
$a_1 = -2$
$a_n = -4a_{n-1} - 2a_{n-2}$

a) 5, –2, 17, –46, 192
b) 5,–2, 10, –56, 176
c) 5,–2, 19, –57, 185
d) 5, –2, –2, 12, –44 ✓ correct

Q37. *[Multiple Choice]*

Find the first 6 terms of a sequence defined by $a_n = a_{n-1} + a_{n-2}, n \geq 3$, if the 7th and 8th terms are 50 and 83.

a) 2, 6, 7, 13, 19, 32
b) –14, 15, 1, 16, 17, 33 ✓ correct
c) 1314, 815, 499, 316, 183, 133
d) 1, 4, 8, 11, 20, 30

Q38. *[Multiple Choice]*

One method for finding the golden ratio, believed by the ancient Greeks to be the most pleasing to the human eye, is to follow these steps:

Step 1: Write the first 10 terms of a sequence defined by $a_1 = 2, a_2 = 5$, and $a_n = a_{n-1} + a_{n-2}, n \geq 3$.
Step 2: Divide each term in the sequence by the term before it.

As the terms increase, their ratios approach the golden ratio.
Find the 10th term of this sequence and the golden ratio to the nearest thousandth.

a) 38, 1.621
b) 212, 1.618 ✓ correct
c) 133, 1.621
d) 133, 1.618

Mathematical Excursions 5th edition Aufmann Test Bank

Q39. *[Multiple Choice]* $a_n = \dfrac{n(n-1)(n-2)(n-3)(n-4)}{4\cdot 3\cdot 2\cdot 1} + 2n$

The *n*th term formula generates 2, 4, 6, 8, 15 for *n* = 1, 2, 3, 4, 5.

Make minor changes to the above formula to produce an *n*th term formula that will generate the sequence 2, 4, 6, 8, 30.

a) $a_n = \dfrac{n(n-1)(n-2)(n-3)(n-4)}{4\cdot 3\cdot 2\cdot 1} + 30n$

b) $a_n = \dfrac{6n(n-1)(n-2)(n-3)(n-4)}{4\cdot 3\cdot 2\cdot 1} + 2n$

c) $a_n = \dfrac{4n(n-1)(n-2)(n-3)(n-4)}{4\cdot 3\cdot 2\cdot 1} + 2n$ **✓ correct**

d) $a_n = \dfrac{n(n-1)(n-2)(n-3)(n-4)}{5\cdot 4\cdot 3\cdot 2\cdot 1} + 6n$

e) $a_n = \dfrac{n(n-1)(n-2)(n-3)(n-4)}{4\cdot 3\cdot 2\cdot 1} + 2n + 15$

Pool 4

Multiple Choice (12)

Q40. *[Multiple Choice]*

If two ladders are placed end to end, their combined height is 42.5 feet. One ladder is 2.5 feet shorter than the other ladder. What are the heights of the two ladders?

a) 20 feet and 22.5 feet ✓ correct
b) 21.25 feet and 23.75 feet
c) 22.5 feet and 25 feet
d) 20 feet and 17.5 feet
e) 42.5 feet and 40 feet

Q41. *[Multiple Choice]*

What is the 17th decimal digit in the decimal representation of $\dfrac{20}{11}$?

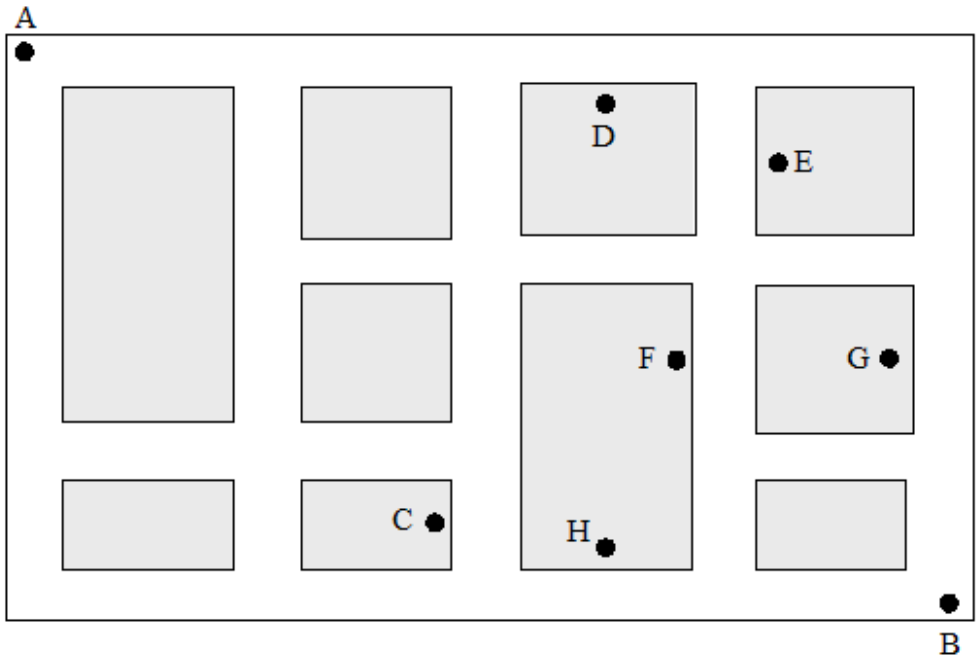
$\dfrac{20}{11} = 1.81818181$

a) 1
b) 8 ✓ correct
c) 9
d) 2
e) 5

Mathematical Excursions 5th edition Aufmann Test Bank

Q42. *[Multiple Choice]*

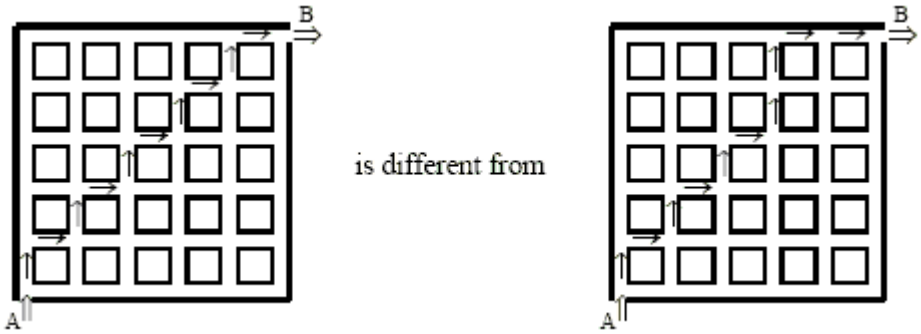
Using the map below, determine the number of direct routes (no backtracking) from point A to point B if you want to pass by point H.



a) 6
b) 9
c) 8
d) 7 ✓ correct
e) 10

Q43. *[Multiple Choice]*

Morris Mouse can easily find his way through the maze from the entrance A to the exit B. However, he only receives food if he finds the exit without going west or south. (North is towards the top of the page.) How many different paths can he take through the maze to receive food? (Note: Different paths have at least one distinct section. See the diagram for an example.)



a) 252 ✓ correct
b) 15,120
c) 30,240
d) none of these

Mathematical Excursions 5th edition Aufmann Test Bank

Q44. *[Multiple Choice]*

Suppose 98 points are placed around a circle. A line segment is drawn between each pair of points. How many line segments are drawn?

a) 9,506
b) 9,604
c) 4,851
d) 98
e) 4,753 ✓ correct

Q45. *[Multiple Choice]*

A parking lot contains a total of 58 cars and motorcycles. There are a total of 188 tires (not counting spare tires) in the lot. Assuming each car has 4 tires and each motorcycle has 2 tires, determine how many cars and how many motorcycles are in the parking lot.

a) 36 motorcycles and 22 cars
b) 22 motorcycles and 36 cars ✓ correct
c) 29 motorcycles and 29 cars
d) 18 motorcycles and 40 cars
e) 26 motorcycles and 32 cars

Q46. *[Multiple Choice]*

Determine the unit digit of 8^{4674}.

a) 8
b) 0
c) 2
d) 4 ✓ correct
e) 6

Q47. *[Multiple Choice]*

The UCSB has 9 squads of badminton players. The UCI team has 5 squads. Every squad from UCSB must play every squad from UCI at least once. What is the least number of games that must be played?

a) 14
b) 45 ✓ correct
c) 20
d) 48

Q48. *[Multiple Choice]*

A baseball team has won more than 85% (but less than 100%) of its games in a season. What is the least possible number of games that the team could have played in the season?

a) 6
b) 7 ✓ correct
c) 8
d) 9
e) 10

Mathematical Excursions 5th edition Aufmann Test Bank

Q49. *[Multiple Choice]*

On three examinations, a student received scores of 70, 80, and 85. What score will the student need on the fourth examination to have an average of 81?

a) 79
b) 78
c) 89 ✓ correct
d) 85
e) 83

Q50. *[Multiple Choice]*

Following the pattern shown in the number sequence below, what is the missing number?
You may find it helpful to list perfect squares or cubes beneath the sequence terms to try to see how they may relate to the sequence.

9 28 65 126 ? 344 513

a) 235
b) 36
c) 216
d) 37
e) 217 ✓ correct

Q51. *[Multiple Choice]*

How many digits does it take in total to number a book from page 24 to page 879?

a) 510
b) 855
c) 2,492 ✓ correct
d) 515
e) 386,760

Fill in the Blank (1)

Q52. *[Fill in the Blank]*

In a chess tournament, each player played a game in the first round. The losers dropped out. This process continued until a winner was declared. The winner of the tournament played 10 games. How many people were in the tournament?

Mathematical Excursions 5th edition Aufmann Test Bank