# *Practical Business Math Procedures 13th edition Slater Solutions Manual*

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2

## END-OF-CHAPTER PROBLEMS

connect

*Check figures for odd-numbered problems in Appendix B.* Name _____ Date _____

### DRILL PROBLEMS

Identify the following types of fractions: *LU 2-1(1)*

**2–1.** $\frac{9}{10}$ Proper

**2–2.** $\frac{12}{11}$ Improper

**2–3.** $\frac{25}{13}$ Improper

Convert the following to mixed numbers: *LU 2-1(2)*

**2–4.** $\frac{91}{10} = 9\frac{1}{10}$

**2–5.** $\frac{921}{15} = 61\frac{6}{15} = 61\frac{2}{5}$

Convert the following to improper fractions: *LU 2-1(2)*

**2–6.** $8\frac{7}{8} = \frac{71}{8}$

**2–7.** $19\frac{2}{3} = \frac{59}{3}$

Reduce the following to the lowest terms. Show how to calculate the greatest common divisor by the step approach. *LU 2-1(3)*

**2–8.** $\frac{16}{38} = \frac{16 \div 2}{38 \div 2} = \frac{8}{19}$

$$\begin{array}{r} 2 \\ 16\overline{)38} \\ 32 \\ \hline 6 \end{array} \quad \begin{array}{r} 2 \\ 6\overline{)16} \\ 12 \\ \hline 4 \end{array} \quad \begin{array}{r} 1 \\ 4\overline{)6} \\ 4 \\ \hline 2 \end{array} \quad \begin{array}{r} 2 \\ 2\overline{)4} \\ 4 \\ \hline 0 \end{array}$$

**2–9.** $\frac{44}{52} = \frac{44 \div 4}{52 \div 4} = \frac{11}{13}$

$$\begin{array}{r} 1 \\ 44\overline{)52} \\ 44 \\ \hline 8 \end{array} \quad \begin{array}{r} 5 \\ 8\overline{)44} \\ 40 \\ \hline 4 \end{array} \quad \begin{array}{r} 2 \\ 4\overline{)8} \\ 8 \\ \hline 0 \end{array}$$

Convert the following to higher terms: *LU 2-1(3)*

**2–10.** $\frac{9}{10} = \frac{63}{70}$ $70 \div 10 = 7 \times 9 = 63$

Determine the LCD of the following (a) by inspection and (b) by division of prime numbers: *LU 2-2(2)*

**2–11.** $\frac{3}{4}, \frac{7}{12}, \frac{5}{6}, \frac{1}{5}$

**Inspection** 60

$2 \times 2 \times 3 \times 5 = 60$

**Check**

$$\begin{array}{r|llll} 2 & 4 & 12 & 6 & 5 \\ \hline 2 & 2 & 6 & 3 & 5 \\ \hline 3 & 1 & 3 & 3 & 5 \\ \hline & 1 & 1 & 1 & 5 \end{array}$$

**2–12.** $\frac{5}{6}, \frac{7}{18}, \frac{5}{9}, \frac{2}{72}$

**Inspection** 72

$2 \times 3 \times 3 \times 4 = 72$

**Check**

$$\begin{array}{r|llll} 2 & 6 & 18 & 9 & 72 \\ \hline 3 & 3 & 9 & 9 & 36 \\ \hline 3 & 1 & 3 & 3 & 12 \\ \hline & 1 & 1 & 1 & 4 \end{array}$$

**2–13.** $\frac{1}{4}, \frac{3}{32}, \frac{5}{48}, \frac{1}{8}$

**Inspection** 96

$2 \times 2 \times 2 \times 2 \times 2 \times 3 = 96$

**Check**

$$\begin{array}{r|llll} 2 & 4 & 32 & 48 & 8 \\ \hline 2 & 2 & 16 & 24 & 4 \\ \hline 2 & 1 & 8 & 12 & 2 \\ \hline 2 & 1 & 4 & 6 & 1 \\ \hline & 1 & 2 & 3 & 1 \end{array}$$

Add the following and reduce to lowest terms: *LU 2-2(1), LU 2-1(3)*

**2–14.** $\frac{3}{9} + \frac{3}{9} = \frac{6}{9} = \frac{2}{3}$

**2–15.** $\frac{3}{7} + \frac{4}{21} = \frac{9}{21} + \frac{4}{21} = \frac{13}{21}$

**2–16.** $6\frac{1}{8} + 4\frac{3}{8} = 10\frac{4}{8} = 10\frac{1}{2}$

**2–17.** $6\frac{3}{8} + 9\frac{1}{24} = 6\frac{9}{24} + 9\frac{1}{24} = 15\frac{10}{24} = 15\frac{5}{12}$

**2–18.** $9\frac{9}{10} + 6\frac{7}{10} = 15\frac{16}{10} = 16\frac{6}{10} = 16\frac{3}{5}$

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Subtract the following and reduce to lowest terms: *LU 2-2(3), LU 2-1(3)*

**2–19.** $\frac{11}{12} - \frac{1}{12} = \frac{10}{12} = \frac{5}{6}$

**2–20.** $14\frac{3}{8} - 10\frac{5}{8}$

$$13\frac{11}{8}$$
$$-10\frac{5}{8}$$
$$3\frac{6}{8} = 3\frac{3}{4}$$

**2–21.** $12\frac{1}{9} - 4\frac{2}{3}$

$$12\frac{1}{9} = 11\frac{10}{9}\left(\frac{9}{9} + \frac{1}{9}\right)$$
$$-4\frac{6}{9} = -4\frac{6}{9}$$
$$7\frac{4}{9}$$

Multiply the following and reduce to lowest terms. Do not use the cancellation technique for these problems. *LU 2-3(1), LU 2-1(3)*

**2–22.** $17 \times \frac{4}{2} = \frac{68}{2} = 34$

**2–23.** $\frac{5}{6} \times \frac{3}{8} = \frac{15}{48} = \frac{5}{16}$

**2–24.** $8\frac{7}{8} \times 64 = \frac{71}{8} \times \frac{64}{1} = \frac{4{,}544}{8} = 568$

Multiply the following. Use the cancellation technique. *LU 2-3(1), LU 2-1(2)*

**2–25.** $\frac{4}{10} \times \frac{30}{60} \times \frac{6}{10} = \frac{\cancel{4}^{\,1}}{\cancel{10}_{\,5}} \times \frac{\cancel{30}^{\,3}}{\cancel{60}_{\,10}} \times \frac{\cancel{6}^{\,1}}{\cancel{10}_{\,5}} = \frac{3}{25}$

**2–26.** $3\frac{3}{4} \times \frac{8}{9} \times 4\frac{9}{12} = \frac{\cancel{15}^{\,5}}{\cancel{4}_{\,1}} \times \frac{\cancel{8}^{\,2}}{\cancel{9}_{\,3}} \times \frac{\cancel{57}^{\,19}}{\cancel{12}_{\,6}} = \frac{95}{6} = 15\frac{5}{6}$

Divide the following and reduce to lowest terms. Use the cancellation technique as needed. *LU 2-3(2), LU 2-1(2)*

**2–27.** $\frac{12}{9} \div 4 = \frac{\cancel{12}^{\,4}}{\cancel{9}_{\,3}} \times \frac{1}{\cancel{4}_{\,1}} = \frac{1}{3}$

**2–28.** $18 \div \frac{1}{5} = 18 \times \frac{5}{1} = 90$

**2–29.** $4\frac{2}{3} \div 12 = \frac{\cancel{14}^{\,7}}{3} \times \frac{1}{\cancel{12}_{\,6}} = \frac{7}{18}$

**2–30.** $3\frac{5}{6} \div 3\frac{1}{2} = \frac{23}{\cancel{6}_{\,3}} \times \frac{\cancel{2}^{\,1}}{7} = \frac{23}{21} = 1\frac{2}{21}$

## WORD PROBLEMS

My Money

**2–31.** Michael Wittry has been investing in his Roth IRA retirement account for 20 years. Two years ago, his account was worth $215,658. After losing $\frac{1}{3}$ of its original value, it then gained $\frac{1}{2}$ of its new value back. What is the current value of his Roth IRA? *LU 2-3(1)*

$\$215{,}658 \times \frac{1}{3} = \$71{,}886$ $\$215{,}658 - \$71{,}886 = \$143{,}772$

$\$143{,}772 \times 1\frac{1}{2} = \$215{,}658$

**2–32.** Delta pays Pete Rose $180 per day to work in the maintenance department at the airport. Pete became ill on Monday and went home after $\frac{1}{6}$ of a day. What did he earn on Monday? Assume no work, no pay. *LU 2-3(1)*

$\frac{1}{6} \times \$180 = \$30$

**2–33.** Statista.com estimated the cumulative 2017 wind power capacity would reach 540,000 megawatts globally. If 2016 was $\frac{9}{10}$ of this, how much was the cumulative 2016 wind power capacity? *LU 2-3(1)*

$540{,}000 \times \frac{9}{10} = 486{,}000$

**2–34.** Joy Wigens, who works at Putnam Investments, received a check for $1,600. She deposited $\frac{1}{4}$ of the check in her Citibank account. How much money does Joy have left after the deposit? *LU 2-3(1)*

$\frac{3}{\cancel{4}_{\,1}} \times \cancel{\$1{,}600}^{\,\$400} = \$1{,}200$



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**2–35.** Lee Jenkins worked the following hours as a manager for a local Pizza Hut: $14\frac{1}{4}, 5\frac{1}{4}, 8\frac{1}{2}$ and $7\frac{1}{4}$. How many total hours did Lee work? *LU 2-2(1)*

$$14\frac{1}{4}+5\frac{1}{4}+8\frac{2}{4}+7\frac{1}{4}=34\frac{5}{4}=35\frac{1}{4}\text{ hours}$$

**2–36.** Lester bought a piece of property in Vail, Colorado. The sides of the land measure $115\frac{1}{2}$ feet, $66\frac{1}{4}$ feet, $106\frac{1}{8}$ feet, and $110\frac{1}{4}$ feet. Lester wants to know the perimeter (sum of all sides) of his property. Can you calculate the perimeter for Lester? *LU 2-2(1)*

$$115\frac{4}{8}+66\frac{2}{8}+106\frac{1}{8}+110\frac{2}{8}=397\frac{9}{8}=398\frac{1}{8}\text{ feet}$$

**2–37.** Tiffani Lind got her new weekly course schedule from Roxbury Community College in Boston. Following are her classes and their length: Business Math, $2\frac{1}{2}$ hours; Introduction to Business, $1\frac{1}{2}$ hours; Microeconomics, $1\frac{1}{2}$ hours; Spanish, $2\frac{1}{4}$ hours; Marketing, $1\frac{1}{4}$ hours; and Business Statistics, $1\frac{3}{4}$ hours. How long will she be in class each week? *LU 2-2(1)*

$$2\frac{1}{2}+1\frac{1}{2}+1\frac{1}{2}+2\frac{1}{4}+1\frac{1}{4}+1\frac{3}{4}=$$

$$2\frac{2}{4}+1\frac{2}{4}+1\frac{2}{4}+2\frac{1}{4}+1\frac{1}{4}+1\frac{3}{4}=8\frac{11}{4}=10\tfrac{3}{4}\text{ hours in class each week}$$

**2–38.** Seventy-seven million people were born between 1946 and 1964. The U.S. Census classifies this group of individuals as baby boomers. It is said that today and every day for the next 18 years, 10,000 baby boomers will reach 65. If $\frac{1}{4}$ of the 65 and older age group uses e-mail, $\frac{1}{5}$ obtains the news from the Internet, and $\frac{1}{6}$ searches the Internet, find the LCD and determine total technology usage for this age group as a fraction. *LU 2-2(1, 2)*

$$\text{LCD}=60$$

$$\frac{1}{4}+\frac{1}{5}+\frac{1}{6}=\frac{15}{60}+\frac{12}{60}+\frac{10}{60}=\frac{37}{60}$$

**2–39.** At a local Walmart store, a Coke dispenser held $19\frac{1}{4}$ gallons of soda. During working hours, $12\frac{3}{4}$ gallons were dispensed. How many gallons of Coke remain? *LU 2-2(2, 3)*

$$19\frac{1}{4}=\quad 18\frac{5}{4}\longleftarrow\left(\frac{4}{4}+\frac{1}{4}\right)$$

$$-12\frac{3}{4}=-12\frac{3}{4}$$

$$6\frac{2}{4}=6\frac{1}{2}\text{ gallons}$$

My Money

**2–40.** CNBC.com reported in 2017 $\frac{35}{100}$ people have saved only a few hundred dollars for retirement and $\frac{34}{100}$ people have zero savings. If there are an estimated 42,729,344 persons more than 64 years old, how many people have not properly prepared for their retirement? Round to the nearest whole person. *LU 2-3(1)*

$$\frac{35}{100}+\frac{34}{100}=\frac{69}{100}\times 42{,}729{,}344=29{,}483{,}247\text{ people}$$

**2–41.** A local garden center charges \$250 per cord of wood. If Logan Grace orders $3\frac{1}{2}$ cords, what will the total cost be? *LU 2-3(1)*

$$\$250\times 3\frac{1}{2}=\$250\times\frac{7}{2}=\$875$$

**2–42.** A local Target store bought 90 pizzas at Pizza Hut for its holiday party. Each guest ate $\frac{1}{6}$ of a pizza and there was no pizza left over. How many guests did Target have for the party? *LU 2-3(1)*

$$90\div\frac{1}{6}=90\times 6=540\text{ guests}$$

**2–43.** Marc, Steven, and Daniel entered into a Subway sandwich shop partnership. Marc owns $\frac{1}{9}$ of the shop and Steven owns $\frac{1}{4}$. What part does Daniel own? *LU 2-2(1, 2)*

$$\frac{4}{36}+\frac{9}{36}=\frac{13}{36}\quad 1-\frac{13}{36}=\frac{23}{36}\text{ for Daniel or }\frac{36}{36}-\frac{13}{36}=\frac{23}{36}$$

**2–44.** Lionel Sullivan works for Burger King. He is paid time and one-half for Sundays. If Lionel works on Sunday for 6 hours at a regular pay of \$8 per hour, what does he earn on Sunday? *LU 2-3(1)*

$$1\frac{1}{2}\times\$8=\frac{3}{2}\times\$8=\$12\quad\$12\times 6=\$72$$

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My Money

**2–45.** Financial analysts recommend people have an emergency fund covering up to six months of expenses. Money.cnn.com reported in 2017 $\frac{31}{100}$ people have such a fund. If you have monthly expenses of $2,100 and have saved only $\frac{2}{5}$ of your recommended six months of expenses, how much more do you have to save? *LU 2-3(1)*

$\$2{,}100 \times 6 = \$12{,}600 \times \frac{2}{5} = \$5{,}040$

$\$12{,}600 - \$5{,}040 = \$7{,}560$

eXcel

**2–46.** A trip to the White Mountains of New Hampshire from Boston will take you $2\frac{3}{4}$ hours. Assume you have traveled $\frac{1}{11}$ of the way. How much longer will the trip take? *LU 2-3(1, 2)*

$\frac{\cancel{10}^{5}}{\cancel{11}_{1}} \times \frac{\cancel{11}^{1}}{\cancel{4}_{2}} = \frac{5}{2} = 2\frac{1}{2}$ hours

eXcel

**2–47.** Andy, who loves to cook, makes apple cobbler for his family. The recipe (serves 6) calls for $1\frac{1}{2}$ pounds of apples, $3\frac{1}{4}$ cups of flour, $\frac{1}{4}$ cup of margarine, $2\frac{3}{8}$ cups of sugar, and 2 teaspoons of cinnamon. Since guests are coming, Andy wants to make a cobbler that will serve 15 (or increase the recipe $2\frac{1}{2}$ times). How much of each ingredient should Andy use? *LU 2-3(1, 2)*

$\frac{3}{2} \times \frac{5}{2} = \frac{15}{4} = 3\frac{3}{4}$ pounds of apples

$\frac{13}{4} \times \frac{5}{2} = \frac{65}{8} = 8\frac{1}{8}$ cups of flour

$\frac{1}{4} \times \frac{5}{2} = \frac{5}{8}$ cup of margarine

$\frac{19}{8} \times \frac{5}{2} = \frac{95}{16} = 5\frac{15}{16}$ cups of sugar

$2 \times \frac{5}{2} = 5$ teaspoons of cinnamon

**2–48.** Mobil allocates $1{,}692\frac{3}{4}$ gallons of gas per month to Jerry's Service Station. The first week, Jerry sold $275\frac{1}{2}$ gallons; second week, $280\frac{1}{4}$ gallons; and third week, $189\frac{1}{8}$ gallons. If Jerry sells $582\frac{1}{2}$ gallons in the fourth week, how close is Jerry to selling his allocation? *LU 2-2(4)*

$275\frac{4}{8}$

$280\frac{2}{8}$

$189\frac{1}{8}$

$+\ 582\frac{4}{8}$

$1{,}326\frac{11}{8} = 1{,}327\frac{3}{8}$ gallons

$1{,}692\frac{6}{8}$

$-\ 1{,}327\frac{3}{8}$

$365\frac{3}{8}$ gallons

**2–49.** A marketing class at North Shore Community College conducted a viewer preference survey. The survey showed that $\frac{5}{6}$ of the people surveyed preferred Apple's iPhone over the Blackberry. Assume 2,400 responded to the survey. How many favored using a Blackberry? *LU 2-3(1, 2)*

$\frac{1}{\cancel{6}_{1}} \times \cancel{2{,}400}^{400} = 400$ people

**2–50.** The price of a used Toyota LandCruiser has increased to $1\frac{1}{4}$ times its earlier price. If the original price of the LandCruiser was $30,000, what is the new price? *LU 2-3(1, 2)*

$1\frac{1}{4} \times \$30{,}000 = \frac{5}{4} \times \$30{,}000 = \$37{,}500$



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**2–51.** Tempco Corporation has a machine that produces $12\frac{1}{2}$ baseball gloves each hour. In the last 2 days, the machine has run for a total of 22 hours. How many baseball gloves has Tempco produced? *LU 2-3(2)*

$$22 \times 12\frac{1}{2} = \overset{11}{\cancel{22}} \times \frac{25}{\underset{1}{\cancel{2}}} = 275 \text{ gloves}$$

**2–52.** Alicia, an employee of Dunkin' Donuts, receives $23\frac{1}{4}$ days per year of vacation time. So far this year she has taken $3\frac{1}{8}$ days in January, $5\frac{1}{2}$ days in May, $6\frac{1}{4}$ days in July, and $4\frac{1}{4}$ days in September. How many more days of vacation does Alicia have left? *LU 2-2(1, 2, 3)*

$$3\frac{1}{8} + 5\frac{4}{8} + 6\frac{2}{8} + 4\frac{2}{8} = 18\frac{9}{8} = 19\frac{1}{8}$$

$$\begin{array}{r} 23\frac{2}{8} \\ -\ 19\frac{1}{8} \\ \hline 4\frac{1}{8} \text{ days left} \end{array}$$

eXcel

**2–53.** A Hamilton multitouch watch was originally priced at \$600. At a closing of the Alpha Omega Jewelry Shop, the watch is being reduced by $\frac{1}{4}$. What is the new selling price? *LU 2-3(1)*

$$\$600 \times \frac{3}{4} = \$450$$

**2–54.** Shelly Van Doren hired a contractor to refinish her kitchen. The contractor said the job would take $49\frac{1}{2}$ hours. To date, the contractor has worked the following hours:

| | | | | |
|---|---|---|---|---|
| Monday | $4\frac{1}{4}$ | $4\frac{2}{8}$ | $49\frac{2}{4}$ | $48\frac{6}{4}$ |
| Tuesday | $9\frac{1}{8}$ | $9\frac{1}{8}$ | $-\ 31\frac{3}{4}$ | $-\ 31\frac{3}{4}$ |
| | | | | $17\frac{3}{4}$ hours to go |
| Wednesday | $4\frac{1}{4}$ | $4\frac{2}{8}$ | | |
| Thursday | $3\frac{1}{2}$ | $3\frac{4}{8}$ | | |
| Friday | $10\frac{5}{8}$ | $+\ 10\frac{5}{8}$ | | |
| | | $30\frac{14}{8} = 31\frac{6}{8} = 31\frac{3}{4}$ hours | | |

How much longer should the job take to be completed? *LU 2-2(4)*

**2–55.** An issue of *Taunton's Fine Woodworking* included plans for a hall stand. The total height of the stand is $81\frac{1}{2}$ inches. If the base is $36\frac{5}{16}$ inches, how tall is the upper portion of the stand? *LU 2-2(4)*

$$\begin{array}{r} 81\frac{1}{2} = 81\frac{8}{16} \\ -36\frac{5}{16} = -36\frac{5}{16} \\ \hline 45\frac{3}{16} \text{ inches} \end{array}$$

**2–56.** Albertsons grocery planned a big sale on apples and received 750 crates from the wholesale market. Albertsons will bag these apples in plastic. Each plastic bag holds $\frac{1}{9}$ of a crate. If Albertsons has no loss to perishables, how many bags of apples can be prepared? *LU 2-3(1)*

$$750 \div \frac{1}{9} = 750 \times 9 = 6{,}750 \text{ bags}$$

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**2–57.** Frank Puleo bought 6,625 acres of land in ski country. He plans to subdivide the land into parcels of $13\frac{1}{4}$ acres each. Each parcel will sell for $125,000. How many parcels of land will Frank develop? If Frank sells all the parcels, what will be his total sales? *LU 2-3(1)*

$$6{,}625 \div 13\frac{1}{4} = 6{,}625 \times \frac{4}{53} = 500 \text{ parcels} \times \$125{,}000 = \$62{,}500{,}000$$

If Frank sells $\frac{3}{5}$ of the parcels in the first year, what will be his total sales for the year?

$$\frac{3}{\cancel{5}_{1}} \times \overset{100}{\cancel{500}} = 300 \times \$125{,}000 = \$37{,}500{,}000$$

**2–58.** A local Papa Gino's conducted a food survey. The survey showed that $\frac{1}{9}$ of the people surveyed preferred eating pasta to hamburger. If 5,400 responded to the survey, how many actually favored hamburger? *LU 2-3(1)*

$$\frac{8}{\cancel{9}_{1}} \times \overset{600}{\cancel{5{,}400}} = 4{,}800 \text{ people}$$

**2–59.** Tamara, Jose, and Milton entered into a partnership that sells men's clothing on the web. Tamara owns $\frac{3}{8}$ of the company and Jose owns $\frac{1}{4}$. What part does Milton own? *LU 2-2(1, 3)*

$$\frac{3}{8} + \frac{2}{8} = \frac{5}{8} \quad 1 - \frac{5}{8} = \frac{3}{8} \text{ for Milton or } \frac{8}{8} - \frac{5}{8} = \frac{3}{8}$$

**2–60.** *Quilters Newsletter Magazine* gave instructions on making a quilt. The quilt required $4\frac{1}{2}$ yards of white-on-white print, 2 yards blue check, $\frac{1}{2}$ yard blue-and-white stripe, $2\frac{3}{4}$ yards blue scraps, $\frac{3}{4}$ yard yellow scraps, and $4\frac{7}{8}$ yards lining. How many total yards are needed? *LU 2-2(1, 2)*

$$4\frac{1}{2} + 2 + \frac{1}{2} + 2\frac{3}{4} + \frac{3}{4} + 4\frac{7}{8} = 4\frac{4}{8} + 2 + \frac{4}{8} + 2\frac{6}{8} + \frac{6}{8} + 4\frac{7}{8} = 12\frac{27}{8} = 15\frac{3}{8} \text{ yards}$$

**2–61.** A trailer carrying supplies for a Krispy Kreme from Virginia to New York will take $3\frac{1}{4}$ hours. If the truck traveled $\frac{1}{5}$ of the way, how much longer will the trip take? *LU 2-3(1, 2)*

$$\frac{\overset{1}{\cancel{4}}}{5} \times \frac{13}{\underset{1}{\cancel{4}}} = \frac{13}{5} = 2\frac{3}{5} \text{ hours}$$

**2–62.** Land Rover has increased the price of a FreeLander by $\frac{1}{5}$ from the original price. The original price of the FreeLander was $30,000. What is the new price? *LU 2-3(1, 2)*

$$1\frac{1}{5} = \frac{6}{\underset{1}{\cancel{5}}} \times \overset{\$6{,}000}{\cancel{\$30{,}000}} = \$36{,}000$$

## CHALLENGE PROBLEMS

**2–63.** *Woodsmith* magazine gave instructions on how to build a pine cupboard. Lumber will be needed for two shelves $10\frac{1}{4}$ inches long, two base sides $12\frac{1}{2}$ inches long, and two door stiles $29\frac{1}{8}$ inches long. Your lumber comes in 6 foot lengths. **(a)** How many feet of lumber will you need? **(b)** If you want $\frac{1}{2}$ a board left over, is this possible with two boards? *LU 2-2(1, 2, 3, 4)*

**a.** $2 \times 10\frac{1}{4} \text{ inches} = \overset{1}{\cancel{2}} \times \frac{41}{\underset{2}{\cancel{4}}} = \frac{41}{2} = 20\frac{1}{2} \text{ inches}$

$2 \times 12\frac{1}{2} \text{ inches} = \overset{1}{\cancel{2}} \times \frac{25}{\underset{1}{\cancel{2}}} = 25 \text{ inches}$

$2 \times 29\frac{1}{8} \text{ inches} = 2 \times \frac{233}{8} = \frac{466}{8} = 58\frac{2}{8} = 58\frac{1}{4} \text{ inches}$

$20\frac{1}{2} + 25 + 58\frac{1}{4} = 103\frac{3}{4} \text{ inches needed}$

$103\frac{3}{4} \text{ inches} \div \frac{12}{1} = \frac{415}{4} \times \frac{1}{12} = \frac{415}{48} = 8\frac{31}{48} \text{ feet}$



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**b.** Board No. 1: 6 feet (72 inches)

$$2 \text{ at } 29\frac{1}{8} = 58\frac{1}{4} = 58\frac{1}{4}$$
$$+1 \text{ at } 12\frac{1}{2} = +\,12\frac{1}{2} = +\,12\frac{2}{4}$$
$$70\frac{3}{4} \text{ inches is most you can cut from board No. 1}$$

$72 \text{ inches} - 70\frac{3}{4} = 1\frac{1}{4}$ inches left from board No. 1

Board No. 2: 6 feet (72 inches)

$103\frac{3}{4}$ inches needed

$-\,70\frac{3}{4}$ used

33 inches needed to complete job

72 inches board No. 2

$-\,33$

39 inches left from board No. 2

Yes, you will have at least 3 feet (36 inches).

**2–64.** Jack MacLean has entered into a real estate development partnership with Bill Lyons and June Reese. Bill owns $\frac{1}{4}$ of the partnership, while June has a $\frac{1}{5}$ interest. The partners will divide all profits on the basis of their fractional ownership. The partnership bought 900 acres of land and plans to subdivide each lot into $2\frac{1}{4}$ acres. Homes in the area have been selling for $240,000. By time of completion, Jack estimates the price of each home will increase by $\frac{1}{3}$ of the current value. The partners sent a survey to 12,000 potential customers to see whether they should heat the homes with oil or gas. One-fourth of the customers responded by indicating a 5-to-1 preference for oil. From the results of the survey, Jack now plans to install a 270-gallon oil tank at each home. He estimates that each home will need five fills per year. The current price of home heating fuel is $1 per gallon. The partnership estimates its profit per home will be $\frac{1}{8}$ the selling price of each home. From the above, please calculate the following: *LU 2-1(1, 2, 3), LU 2-2(1, 2, 3, 4), LU 2-3(1, 2)*

**a.** Number of homes to be built.

$$900 \div 2\frac{1}{4} = \overset{100}{\cancel{900}} \times \frac{4}{\cancel{9}_{1}} = 400 \text{ homes}$$

**b.** Selling price of each home.

$$1\frac{1}{3} \times \$240{,}000 = \frac{4}{\cancel{3}_{1}} \times \overset{\$80{,}000}{\cancel{\$240{,}000}} = \$320{,}000$$

**c.** Number of people responding to survey.

$$\frac{1}{4} \times 12{,}000 = 3{,}000 \text{ people}$$

**d.** Number of people desiring oil.

$$\frac{5}{6} \times 3{,}000 = 2{,}500 \text{ people}$$

**e.** Average monthly cost per house to heat using oil.

$$270 \times 5 = 1{,}350 \times \$1 = \frac{\$1{,}350}{12} = \$112.50$$

**f.** Amount of profit Jack will receive from the sale of homes.

$$\frac{1}{4} + \frac{1}{5} = \frac{5}{20} + \frac{4}{20} = \frac{9}{20}$$

$$\frac{1}{\cancel{8}_{1}} \times \overset{\$40{,}000}{\cancel{\$320{,}000}} = \$40{,}000$$

$1 - \frac{9}{20} = \frac{11}{20}$ for Jack

$\$40{,}000 \times 400 = \$16{,}000{,}000$

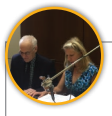
$$\frac{11}{20} \times \$16{,}000{,}000 = \$8{,}800{,}000$$

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## SUMMARY PRACTICE TEST

Do you need help? Connect videos have step-by-step worked-out solutions.

Identify the following types of fractions. *LU 2-1(1)*

**1.** $5\frac{1}{8}$ Mixed **2.** $\frac{2}{7}$ Proper **3.** $\frac{20}{19}$ Improper

**4.** Convert the following to a mixed number. *LU 2-1(2)*

$\frac{163}{9} = 18\frac{1}{9}$

**5.** Convert the following to an improper fraction. *LU 2-1(2)*

$8\frac{1}{8} = \frac{64+1}{8} = \frac{65}{8}$

**6.** Calculate the greatest common divisor of the following by the step approach and reduce to lowest terms. *LU 2-2(1, 2)*

$\frac{63}{90} = 63\overline{)90}\ 27\overline{)63}\ 9\overline{)27}$ (1; 2; 3) remainders $\frac{63}{27}$, $\frac{54}{9}$, $\frac{27}{0}$ $\qquad \frac{63 \div 9}{90 \div 9} = \frac{7}{10}$

**7.** Convert the following to higher terms. *LU 2-1(3)*

$\frac{16}{94} = \frac{?}{376}$ $\qquad 376 \div 94 = 4 \times 16 = 64$

**8.** Find the LCD of the following by using prime numbers. Show your work. *LU 2-2(2)*

$\frac{1}{8} + \frac{1}{3} + \frac{1}{2} + \frac{1}{12}$

| | | | | |
|---|---|---|---|---|
| 2 | 8 | 3 | 2 | 12 |
| 2 | 4 | 3 | 1 | 6 |
| 3 | 2 | 3 | 1 | 3 |
| | 2 | 1 | 1 | 1 |

$2 \times 2 \times 3 \times 2 \times 1 \times 1 \times 1 = 24$

**9.** Subtract the following. *LU 2-2(4)*

$15\frac{4}{5} = 15\frac{16}{20} = 14\frac{36}{20}\left(\frac{16}{20} + \frac{20}{20}\right)$

$-8\frac{19}{20} = -8\frac{19}{20}$ $\qquad 8\frac{19}{20}$

$6\frac{17}{20}$

Complete the following using the cancellation technique. *LU 2-3(1, 2)*

**10.** $\frac{3}{4} \times \frac{2}{4} \times \frac{6}{9} = \frac{\overset{1}{\cancel{3}}}{\underset{2}{\cancel{4}}} \times \frac{\overset{1}{\cancel{2}}}{\underset{2}{\cancel{4}}} \times \frac{\overset{1}{\cancel{6}}}{\underset{1}{\cancel{9}}} = \frac{1}{4}$ **11.** $7\frac{1}{9} \times \frac{6}{7} = \frac{64}{\underset{3}{\cancel{9}}} \times \frac{\overset{2}{\cancel{6}}}{7} = \frac{128}{21} = 6\frac{2}{21}$ **12.** $\frac{3}{7} \div 6 = \frac{\overset{1}{\cancel{3}}}{7} \times \frac{1}{\underset{2}{\cancel{6}}} = \frac{1}{14}$

**13.** A trip to Washington from Boston will take you $5\frac{3}{4}$ hours. If you have traveled $\frac{1}{3}$ of the way, how much longer will the trip take? *LU 2-3(1)*

$\frac{23}{4} \times \frac{2}{3} = \frac{46}{12} = 3\frac{10}{12} = 3\frac{5}{6}$ hours

**14.** Quiznos produces 640 rolls per hour. If the oven runs $12\frac{1}{4}$ hours, how many rolls will the machine produce? *LU 2-3(1, 2)*

$\frac{\overset{160}{\cancel{640}}}{1} \times \frac{49}{\underset{1}{\cancel{4}}} = 7{,}840$ rolls

**15.** A taste-testing survey of Zing Farms showed that $\frac{2}{3}$ of the people surveyed preferred the taste of veggie burgers to regular burgers. If 90,000 people were in the survey, how many favored veggie burgers? How many chose regular burgers? *LU 2-3(1)*

Veggie burgers: $\frac{2}{3} \times 90{,}000 = 60{,}000$ $\qquad$ Regular burgers: $\frac{1}{3} \times 90{,}000 = 30{,}000$

**16.** Jim Janes, an employee of Enterprise Co., worked $9\frac{1}{4}$ hours on Monday, $4\frac{1}{2}$ hours on Tuesday, $9\frac{1}{4}$ hours on Wednesday, $7\frac{1}{2}$ hours on Thursday, and 9 hours on Friday. How many total hours did Jim work during the week? *LU 2-2(1, 2)*

$9\frac{1}{4} + 4\frac{2}{4} + 9\frac{1}{4} + 7\frac{2}{4} + 9 = 39\frac{1}{2}$

**17.** JCPenney offered a $\frac{1}{3}$ rebate on its $39 hair dryer. Joan bought a JCPenney hair dryer. What did Joan pay after the rebate? *LU 2-3(1)*

$\frac{2}{3} \times \$39 = \$26$



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# TIPS FROM JEFF AND SHARON ON TEACHING BUSINESS MATH

## Chapter 2

1. I talk to the students about the *Wall Street Journal* clip "Empowered Patients" We talk about how ¾ of U.S. Internet users go online for health information. For this chapter, I bring in a bag of M&M's® Chocolate Candies and see how close this pack is to the results shown in the introduction to Chapter 2.
2. We talk about pizza—$\frac{1}{2}$ or $\frac{4}{8}$ is the same amount of pizza.
3. We talk about the step approach, since many students have not seen this. Keep reinforcing the function of each color.
4. In Learning Unit 2-2 we discuss online video sharing sites like YouTube.
5. We go over the prime numbers and how to find the least common denominator.
6. We cover the section on Dissecting a Word Problem. I continually am upbeat and tell them the more we do the easier it will get.
7. We review the clipping of M&M's® Brownies.
8. I do the drill and word problems at the end of the chapter, reminding them to do all quizzes and to review the LU and SPT videos in Connect. I remind them of the extra Practice Quizzes that are available. I recommend highly the Interactive Chapter Organizers. We cover the Critical Thinking Discussion Questions and Concept Checks. Keep in mind that at the end of the text in Appendix A there are drill and word problems by learning unit.
9. The *Kiplinger* article, as well as the My Money segment, gives you lots of different slants for your class.
10. You may want to talk about how to use Slater's website. We discuss Connect.
11. I remind them that of all worked at solutions to Practice Quiz are found on Connect along with the summary practice tests.

P.S. If you are looking to review Chapter 1 you may want to run off the word problems in Chapter 1 called Additional Problems for Classroom Use. These five problems in each chapter make a good cumulative review.


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C H A P T E R

# 2

# FRACTIONS

## Outline

**LU 2-1 Types of Fractions and Conversion Procedures**

1. Types of fractions
   a. Proper, improper, mixed
2. Conversion procedures
   a. Improper to whole or mixed
   b. Mixed to improper
   c. Converting to lowest terms
      1. Observation
      2. Step approach
         a. Divide smaller number into larger
         b. Divide remainder into previous divisor and continue process until no remainder results
   d. Converting fractions to higher terms
      1. Requires multiplying the numerator and denominator by the same number

**LU 2-2 Adding and Subtracting Fractions**

1. Addition of fractions
   a. Proper fractions with same denominators
   b. Fractions with different denominators
      1. Find LCD before adding
         a. Observation
         b. Prime numbers
   c. Adding mixed numbers
2. Subtraction of fractions
   a. Proper fractions with same denominators
   b. Subtracting mixed numbers

## Points to Stress Based on Typical Student Misconceptions

2/3 is a proper fraction, as seen in The Wall Street Journal clip on yearly checkups.

Denominator stays the same in converting to an improper from a mixed number.

Last divisor is the greatest common divisor. Fractions raised to higher terms are equivalent in value.

Always reduce your final answer to lowest terms. Review how to divide prime numbers into denominators. In text we stop dividing when no prime number can divide evenly into at least two numbers.

Review concept of borrowing. Stress $\frac{4}{4}$ is equal to 1 in the borrowing process.



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**LU 2-3 Multiplying and Dividing Fractions**

1. Multiplying proper fractions
   a. Use of cancellation
      1. Divide a number into a numerator and denominator
2. Division of fractions
   a. Use the reciprocal (divisor inverted) and multiply
3. Dividing mixed numbers
   a. Change to improper fractions, invert divisor and multiply

Always reduce answers to lowest terms. This will not be necessary if canceling is completely done. Canceling has no one set order.


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# CHAPTER 2 THE POCKET CALCULATOR WORKSHOP HANDOUT

The Problem: Frank Puleo bought 6,625 acres of land in ski country. He plans to subdivide the land into parcels of 13 ¼ acres each. Each parcel will sell for $125,000. How many parcels of land will Frank develop? If Frank sells all the parcels, what will be his total sales?

**Part I**

| **Step 1** | **Display** |
|---|---|
| 13 [×] 4 [+] 1 [=] | 53 |
| This gets the $13\frac{1}{4} = \frac{53}{4}$ | |
| **Step 2** | |
| 6625 [×] 4 [÷] 53 = M+ | 500 |
| 125000 [×] MR [=] | 62500000 |

**Part II** (Do not clear, continue on.)

| **Step 3** | |
|---|---|
| 3 [×] [MR] [÷] 5 [×] 125000 [=] | 37500000 |

Stored in M+ is the 500 that represents number of parcels.
This figure is recalled [MR] in Step 3 to calculate total sales.

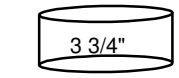

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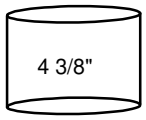
# CHAPTER 2 SUGGESTED SOLUTIONS TO CRITICAL THINKING DISCUSSION QUESTIONS WITH CHAPTER CONCEPT CHECK

1. Divide the numerator by the denominator.
   If you have no remainder, the quotient is a whole number.
   If you have a remainder, the answer is a mixed number with the remainder placed over the old denominator as the proper fraction of the mixed number.
   $\frac{3}{2}$ of a pizza is really $1\frac{1}{2}$ pizza; $\frac{8}{8}$ is really one pizza sliced into 8 parts.
2. Multiply the whole number by the denominator (Step 1).
   Add the answer from Step 1 to the numerator (Step 2).
   Place the answer in Step 2 over the old denominator (Step 3).
   John ordered 4 doughnuts and ate $3\frac{1}{2}$ or $\frac{7}{2}$ of the doughnuts.
3. The greatest common divisor is the largest possible number (divisor) that will divide evenly into both the numerator and denominator.
   If we divide the top and bottom by 5, the greatest common denominator, we could say 7 out of 12 people prefer MCI to AT&T.
4. Step 1: Divide the smaller number of the fraction into the larger number.
   Step 2: Divide the remainder into the divisor of Step 1. Continue this process until you have no remainder.
   Step 3: The last divisor you see is the greatest common divisor.

   $\frac{35}{60}$ $\quad 35\overline{)60}^{\,1}$ (35) $\quad 25\overline{)35}^{\,1}$ (25) $\quad 10\overline{)25}^{\,2}$ (20) $\quad \textcircled{5}\overline{)10}^{\,2}$ (10), (0)
5. To add proper fractions with different denominators you should: Find LCD; change each fraction to a like fraction; add the numerators and place total over the LCD; if necessary, reduce the answer to lowest terms.
   To subtract proper fractions with different denominators you should: Find the LCD; raise the fraction to its equivalent value; subtract the numerators and place answer over the LCD; if necessary, reduce the answers to lowest terms.
   When subtracting mixed numbers (when borrowing is necessary) you should: make sure the fractions have the LCD; borrow from the whole number; subtract the whole numbers and fractions; reduce the fraction(s) to lowest terms.



Campbell's Soup



OceanSpray Cranberry Sauce

$$4\frac{3}{8} = \quad 4\frac{3}{8} = \quad 3\frac{11}{8}\left(\frac{3}{8}+\frac{8}{8}\right)$$
$$-3\frac{3}{4} = \quad 3\frac{6}{8} = \quad 3\frac{6}{8}$$
$$\frac{5}{8} \text{ difference}$$


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6. A prime number is a whole number greater than one that is only divisible by itself and one. The number one is not a prime number.

$$\begin{array}{r|ll} 2 & 8 & 4 \\ \hline 2 & 4 & 2 \\ & 2 & 1 \end{array} \quad \text{LCD} = 2 \times 2 \times 2 \times 1 = 8$$

7. In multiplying proper fractions you would multiply the numerators and denominators; reduce to lowest terms or use the cancellation method. If you are multiplying mixed numbers you would convert the mixed numbers to improper fractions before completing the above steps.

   Let's say you bought $4\frac{1}{2}$ cartons of computer paper at Staples. Within a week, $\frac{2}{3}$ of the paper was used up. How much paper is left?

$$\frac{1}{3} \times 4\frac{1}{2} = \frac{1}{\cancel{3}_{1}} \times \frac{\overset{3}{\cancel{9}}}{2} = \frac{3}{2} = 1\frac{1}{2} \text{ cartons}$$

8. Chapter Concept Check: Answers will vary depending on students' research.

## My Money page

The My Money page covers content related to the chapter material providing students some key facts they need to know. In addition, information is provided on how students would use the information. Finally, an activity is provided at the end for students to apply what is presented in the My Money segment. Answers will vary by student.

Chapter 2 My Money deals with researching the potential pay ranges of careers students will enter upon graduation. By completing this research early on, students can better direct their efforts toward a career opportunity that matches well with their financial goals.


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# Kiplinger Worksheet

Date _____ Name _____

## A Group Project

In your group you will have to either defend or reject the following business math issue based on the *Kiplinger's Personal Finance Magazine* article just presented:

**The Business Math Issue**

Saving 1/4 to 1/3 of sticker price shown means
your college goals will be met.

1. List the key points of the article and information to support your position.

2. Write a group defense of your position using math calculations to support your view. If you are in an online course, post to a discussion board.



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# Teaching Guide to Kiplinger Chapter 2

Points to consider:

- Unemployment rate
- Cost of borrowing
- Scholarships
- Special training vs. General training
- Ways one can cut costs
- Online learning vs. Traditional education
- Work first and let employer pay college costs
- Reputation of school you attend


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# CHAPTER 2 ADDITIONAL WORD PROBLEMS FOR CLASSROOM USE

1. The computerized version of Monopoly slashes playing time by $\frac{2}{3}$ compared to the board game. The Randolphs play the board game in $9\frac{1}{2}$ hours. If they buy the computerized version, how long will it take them to play? How much time do they save? Prove your answers.

2. The following is the recipe to make one dozen muffins: $1\frac{1}{2}$ cups flour; $\frac{1}{3}$ cups sugar; 2 tsps. baking powder; 1 egg; $\frac{1}{2}$ cup Crisco; $\frac{3}{4}$ cup skim milk; $\frac{3}{4}$ cup blueberries. If Ron Regis wants to make 18 muffins, how much of each ingredient will be required for the recipe?

3. Last year the price of a Jeep wagon was $16,000. It was announced that this year's price would go up by $\frac{1}{8}$ of last year's price. This year the dealer expects to make a profit of $\frac{1}{9}$ of the selling price. What is the new car price and what is the profit that a dealer makes on the sale of the Jeep?

4. A Texaco station was being remodeled. The contractor said the job would take $38\frac{1}{2}$ hours to complete. To date the contractor has worked the following hours:
   $M - 4\frac{1}{2;}$ $T - 9\frac{1}{2}$; $W - 3\frac{1}{4}$; $TH - 4\frac{1}{8}$; $F - 6\frac{1}{4}$
   How much longer should the job take to be completed?

5. Pete and Bill are having a debate as to which of the following fractions is the largest:

   $\frac{3}{10}$ $\frac{1}{4}$ $\frac{2}{5}$

   Using the LCD by prime numbers, could you settle this debate?


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# CHAPTER 2 SOLUTIONS FOR ADDITIONAL WORD PROBLEMS FOR CLASSROOM USE

Solution 1

$\frac{2}{3} \times 9\frac{1}{2} = \frac{1}{3} \times \frac{19}{2} = \frac{19}{6} = 3\frac{1}{6}$ hours to play

$\frac{2}{3} \times 9\frac{1}{2} = \frac{2}{3} \times \frac{19}{2} = \frac{38}{6} = 6\frac{2}{6} = 6\frac{1}{3}$ hours saved

Check

$$\begin{array}{r} 9\frac{1}{2} = \\ -6\frac{1}{3} \\ \hline \end{array} \qquad \begin{array}{r} 9\frac{3}{6} \\ -6\frac{2}{6} \\ \hline 3\frac{1}{6} \end{array}$$

Solution 2

| | |
|---|---|
| Flour | $1\frac{1}{2} \times 1\frac{1}{2} = \frac{3}{2} \times \frac{3}{2} = \frac{9}{4} = 2\frac{1}{4}$ cups |
| Sugar | $\frac{1}{3} \times \frac{3}{2} = \frac{3}{6} = \frac{1}{2}$ cup |
| Baking powder | $2 \times \frac{3}{2} = \frac{6}{2} = 3$ tsps. |
| Egg | $1 \times \frac{3}{2} = \frac{3}{2} = 1\frac{1}{2}$ eggs |
| Crisco | $\frac{1}{2} \times \frac{3}{2} = \frac{3}{4}$ cup |
| Milk | $\frac{3}{4} \times \frac{3}{2} = \frac{9}{8} = 1\frac{1}{8}$ cups |
| Blueberries | $\frac{3}{4} \times \frac{3}{2} = \frac{9}{8} = 1\frac{1}{8}$ cups |

Solution 3

$1\frac{1}{8} = \frac{9}{8} \times \$16{,}000 = \$18{,}000$ cost of new car

$\frac{1}{9} \times \$18{,}000 = \$2{,}000$ profit

Solution 4

$$\begin{array}{r} 4\frac{1}{2} = \\ 9\frac{1}{2} = \\ 3\frac{1}{4} = \\ 4\frac{1}{8} = \\ 6\frac{1}{4} = \\ \hline \end{array} \qquad \begin{array}{r} 4\frac{4}{8} \\ 9\frac{4}{8} \\ 3\frac{2}{8} \\ 4\frac{1}{8} \\ 6\frac{2}{8} \\ \hline 26\frac{13}{8} = 27\frac{5}{8} \end{array}$$

$$\begin{array}{r} 38\frac{1}{2} = 38\frac{4}{8} = 37\frac{12}{8} \\ -27\frac{5}{8} = 27\frac{5}{8} = 27\frac{5}{8} \\ \hline 10\frac{7}{8} \text{ hours to go} \end{array}$$



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Solution 5

$$\begin{array}{r|lll} 2 & 10 & 4 & 5 \\ \hline 5 & 5 & 2 & 5 \\ \hline & 1 & 2 & 1 \end{array} \qquad 2 \times 5 \times 1 \times 2 \times 1 = 20$$

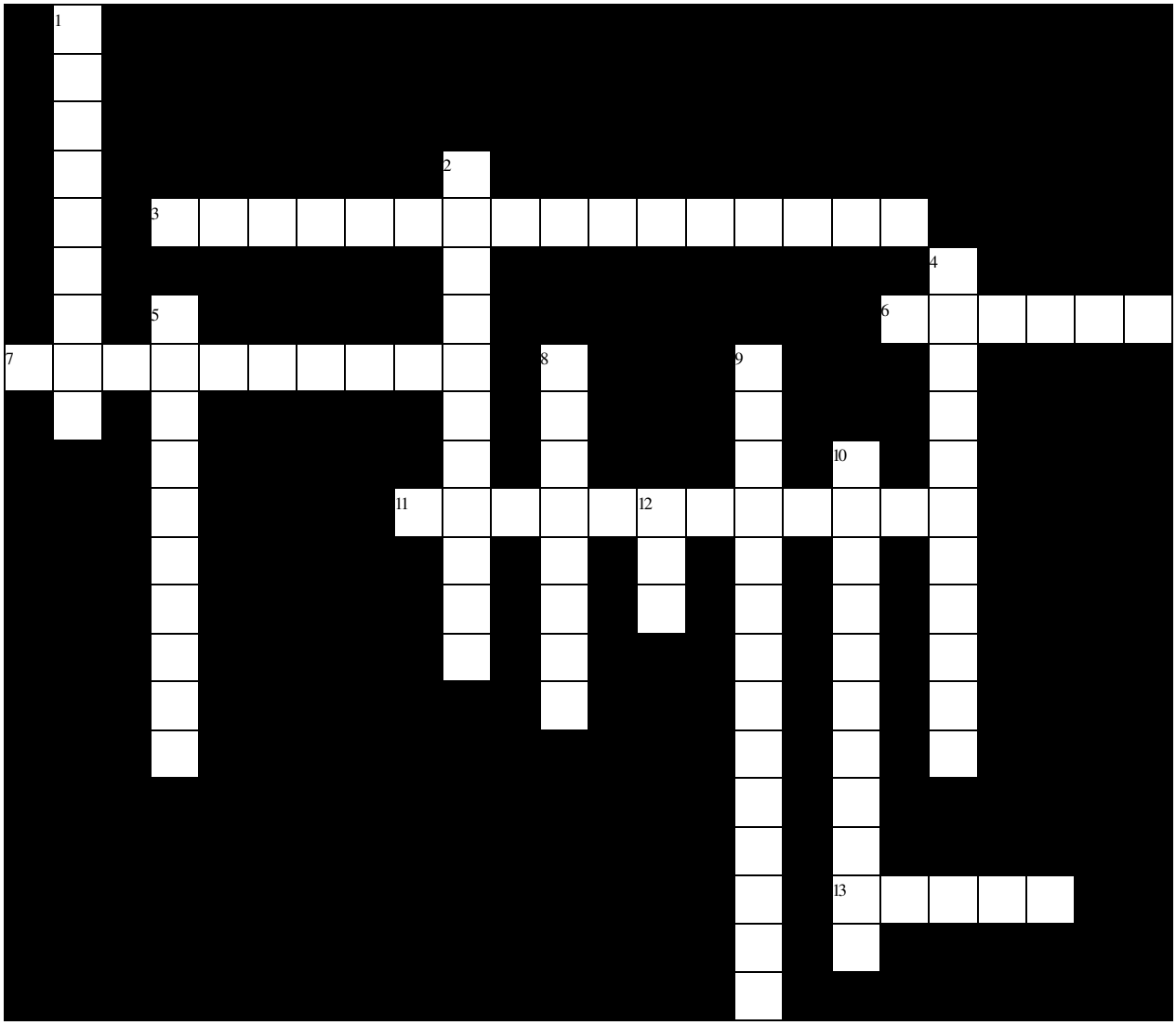
$$\frac{3}{10} = \frac{6}{20};\ \frac{1}{4} = \frac{5}{20};\ \frac{2}{5} = \frac{8}{20}$$

$\frac{2}{5}$ is the largest


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# Chapter 2 Crossword Puzzle



**Across**

**3** Numerator is equal to or greater than denominator
**6** Numerator is less than denominator
**7** A fraction should be reduced to its _____ _____
**11** The reducing process
**13** Whole number and proper fraction

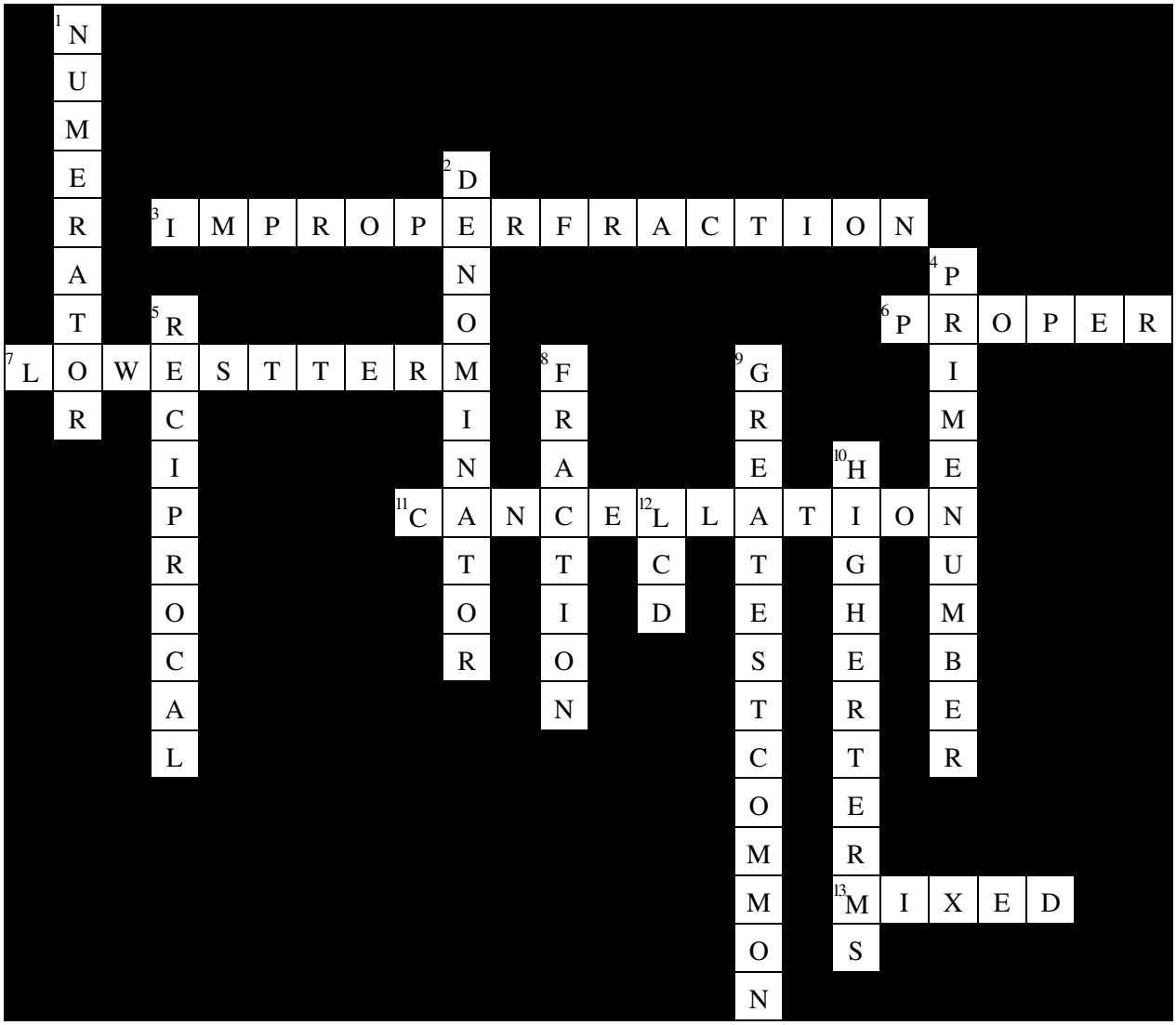
**Down**

**1** Top of fraction
**2** Bottom of fraction
**4** Only divisible by itself and one
**5** Flipping a fraction
**8** A form expressing a relationship
**9** Largest possible number to divide evenly into top and bottom of a fraction
**10** Fractions can be raised to _____
**12** Abbreviation for least common denominator


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# Chapter 2 Solution






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