Lesson 10 Practice Problems

Problem 1

What percentage of a dollar is the value of each coin combination?

a. 4 dimes

b. 1 nickel and 3 pennies

c. 5 quarters and 1 dime

Possible Solutions

a. 40%

b. 8%

c. 135%

Problem 2

a. List three different combinations of coins, each with a value of 30% of a dollar.

b. List two different combinations of coins, each with a value of 140% of a dollar.

Possible Solutions

Answers vary. Sample response:

a. 30 pennies, 6 nickels, or 3 dimes

b. 140 pennies, 14 dimes, or 5 quarters and 3 nickels

Problem 3

The United States government used to make coins of many different values. For each coin, state its worth as a percentage of $1.

Lesson 10 Practice Problems

a. $\frac{1}{2}$ cent

b. 3 cents

c. 20 cents

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

e. $5

Possible Solutions

a. $\frac{1}{2}\%$

b. 3%

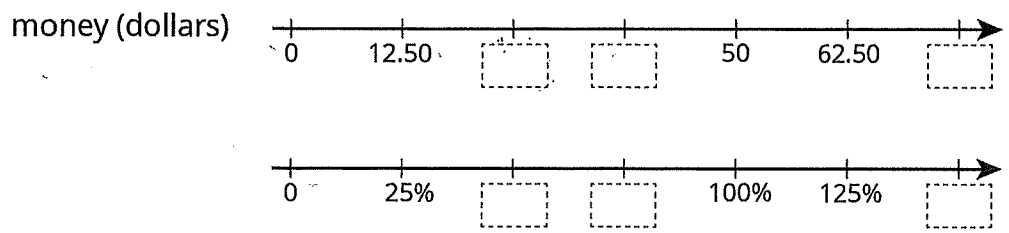
c. 20%

d. 250%

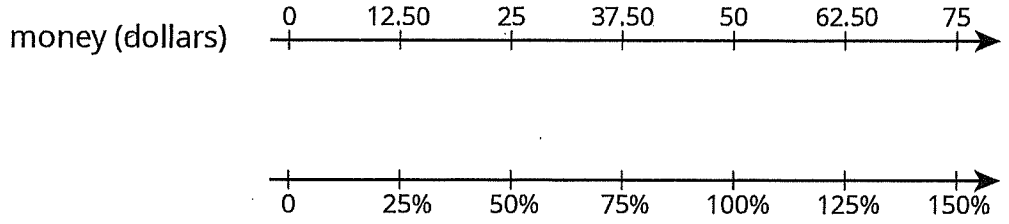
e. 500%

Problem 4

Complete the double number to line show percentages of $50.



Possible Solutions



Problem 5

From Grade 6, Unit 3, Lesson 9

Elena bought 8 tokens for $4.40. At this rate:

a. How many tokens could she buy with $6.05?

b. How much do 19 tokens cost?

Possible Solutions

a. 11 tokens

b. $10.45

Problem 6

From Grade 6, Unit 3, Lesson 8

A snail travels 10 cm in 4 minutes. At this rate:

a. How long will it take the snail to travel 24 cm?

b. How far does the snail travel in 6 minutes?

Possible Solutions

a. 9.6 minutes (or equivalent)

b. 15 cm

Problem 7

From Grade 6, Unit 3, Lesson 7

a. 3 tacos cost $18. Complete the table to show the cost of 4, 5, and 6 tacos at the same rate.

b. If you buy t tacos for c dollars, what is the unit rate?

number of tacos	cost in dollars	rate in dollars per taco
3	18	
4		
5		
6		

Possible Solutions

a.

number of tacos	cost in dollars	rate in dollars per taco
3	18	6
4	24	6

number of tacos	cost in dollars	rate in dollars per taco
5	30	6
6	36	6

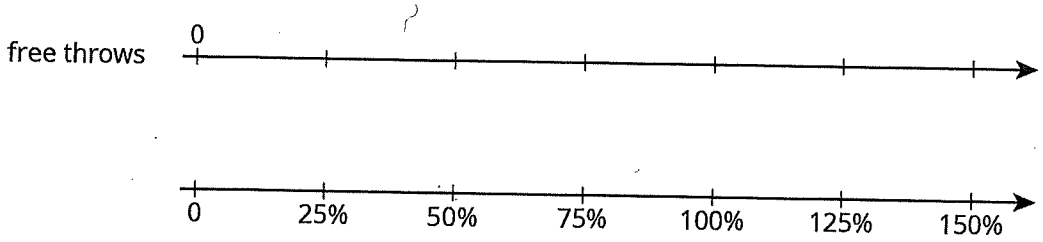
b. $\frac{c}{t}$ dollars per taco or $\frac{t}{c}$ tacos per dollar.

Lesson 11 Practice Problems

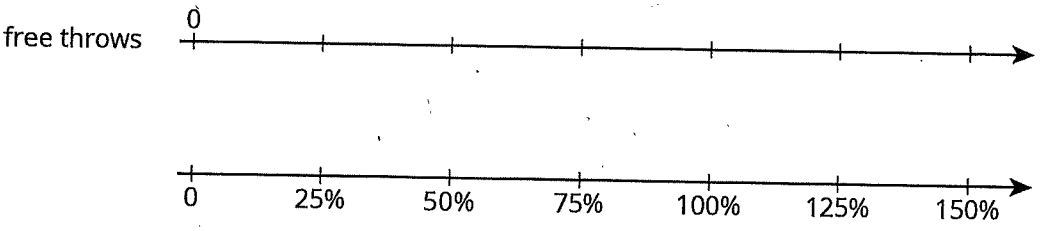
Problem 1

Solve each problem. If you get stuck, consider using the double number lines.

a. During a basketball practice, Mai attempted 40 free throws and was successful on 25% of them. How many successful free throws did she make?



b. Yesterday, Priya successfully made 12 free throws. Today, she made 150% as many. How many successful free throws did Priya make today?



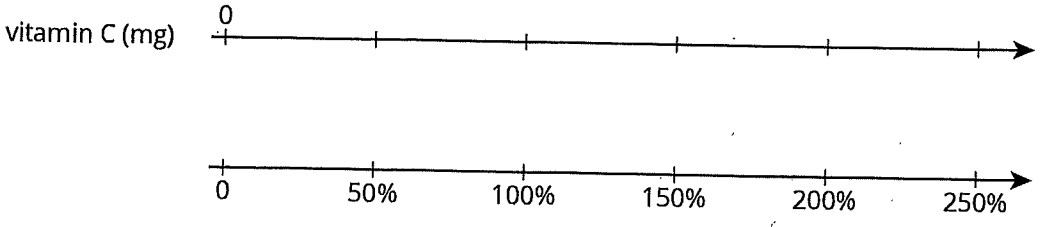
Possible Solutions

a. 10 free throws

b. 18 free throws

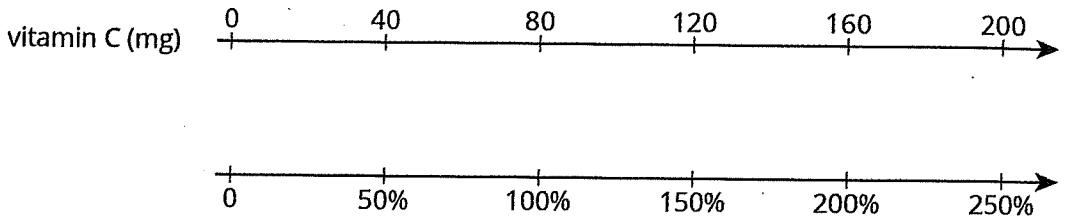
Problem 2

A 16-ounce bottle of orange juice says it contains 200 milligrams of vitamin C, which is 250% of the daily recommended allowance of vitamin C for adults. What is 100% of the daily recommended allowance of vitamin C for adults?



Possible Solutions

80 mg. Explanations vary. Sample explanation: 80 mg is 100% of the daily recommended allowance. The double number line can be used to show this: 80 is above 100%. So half of 80 is above half of 100%, that is, 40 is above 50%. Also, 2 times 80 is above 2 times 100%, that is, 160 is above 200%. So, the number above 250% is the number above 50% plus the number above 200%, which is 40 plus 160.

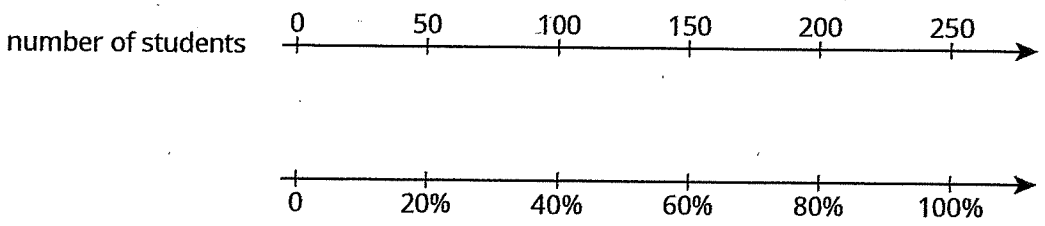


Problem 3

At a school, 40% of the sixth-grade students said that hip-hop is their favorite kind of music. If 100 sixth-grade students prefer hip hop music, how many sixth-grade students are at the school? Explain or show your reasoning.

Possible Solutions

250. Explanations vary. Possible explanation:



Problem 4

From Grade 6, Unit 3, Lesson 9

Lesson 11 Practice Problems

Diego has a skateboard, scooter, bike, and go-cart. He wants to know which vehicle is the fastest. A friend records how far Diego travels on each vehicle in 5 seconds. For each vehicle, Diego travels as fast as he can along a straight, level path.

vehicle	distance traveled
skateboard	90 feet
scooter	1,020 inches
bike	4,800 centimeters
go-cart	0.03 kilometers

a. 100 inches equal 254 centimeters. What is the distance each vehicle traveled in centimeters?

b. Rank the vehicles in order from fastest to slowest.

Possible Solutions

a. Skateboard: 2,743.2. Scooter: 2,590.8. Bike: 4,800. Go-cart: 3,000.

b. Bike, go-cart, skateboard, scooter

Problem 5

From Grade 6, Unit 3, Lesson 7

It takes 10 pounds of potatoes to make 15 pounds of mashed potatoes. At this rate:

a. How many pounds of mashed potatoes can they make with 15 pounds of potatoes?

b. How many pounds of potatoes are needed to make 50 pounds of mashed potatoes?

Possible Solutions

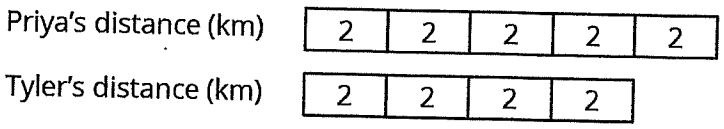
a. To find the amount of mashed potatoes, multiply the amount of potatoes by $\frac{3}{2}, 22\frac{1}{2}$ pounds of mashed potatoes (or equivalent).

b. To find the potatoes, multiply the amount of mashed potatoes by $\frac{2}{3}, 33\frac{1}{3}$ pounds of potatoes (or equivalent).

Lesson 12 Practice Problems

Problem 1

Here is a tape diagram that shows how far two students walked.



a. What percentage of Priya's distance did Tyler walk?

b. What percentage of Tyler's distance did Priya walk?

Possible Solutions

a. 80%

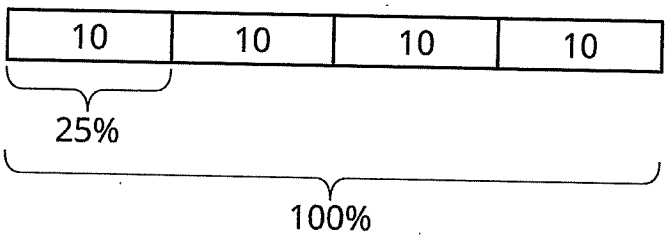
b. 125%

Problem 2

A bakery makes 40 different flavors of muffins. 25% of the flavors have chocolate as one of the ingredients. Draw a tape diagram to show how many flavors have chocolate and how many don't.

Possible Solutions

Each unit in the tape diagram represents 25%, so 10 have chocolate and 30 do not.



Problem 3

There are 70 students in the school band. 40% of them are sixth graders, 20% are seventh graders, and the rest are eighth graders.

a. How many band members are sixth graders?

b. How many band members are seventh graders?

c. What percentage of the band members are eighth graders? Explain your reasoning.

Possible Solutions

a. 28 ($70 \cdot 0.4 = 28$)

b. 14 ($70 \cdot 0.2 = 14$)

c. 40% because the other percentages add up to 60% and that leaves 40%, because $100 - 60 = 40$.

Problem 4

From Grade 6, Unit 3, Lesson 11

Jada has a monthly budget for her cell phone bill. Last month she spent 120% of her budget, and the bill was $60. What is Jada's monthly budget? Explain or show your reasoning.

Possible Solutions

$50. Strategies vary. Sample reasoning: If 120% is 60, then 20% is 10, which I get by multiplying each by $\frac{1}{6}$. If 20% is 10, then 100% is 50, which I get by multiplying each by 5.

Problem 5

From Grade 6, Unit 3, Lesson 9

Which is a better deal, 5 tickets for $12.50 or 8 tickets for $20.16? Explain your reasoning.

Possible Solutions

5 tickets for $12.50 is a better deal. 5 tickets for $12.50 equals a unit rate of $2.50 per ticket, ($12.50 \div 5 = 2.50$), and 8 tickets for $20.16 equals a unit rate of $2.52 per ticket, ($12.50 \div 8 = 2.52$).

Problem 6

From Grade 6, Unit 3, Lesson 8

An athlete runs 8 miles in 50 minutes on a treadmill. At this rate:

a. How long will it take the athlete to run 9 miles?

b. How far can the athlete run in 1 hour?

Possible Solutions

a. 56.25 minutes (or equivalent)

b. 9.6 miles (or equivalent)

Lesson 13 Practice Problems

Problem 1

a. How can you find 50% of a number quickly in your head?

b. Andre lives 1.6 km from school. What is 50% of 1.6 km?

c. Diego lives $\frac{1}{2}$ mile from school. What is 50% of $\frac{1}{2}$ mile?

Possible Solutions

a. Answers vary. Sample response: Divide the number by 2 (or multiply it by $\frac{1}{2}$).

b. 0.8 km (or equivalent)

c. $\frac{1}{4}$ mile (or equivalent)

Problem 2

There is a 10% off sale on laptop computers. If someone saves $35 on a laptop, what was its original cost? If you get stuck, consider using the table.

savings (dollars)	percentage
35	10
?	100

Possible Solutions

$350

Problem 3

Explain how to calculate these mentally.

a. 15 is what percentage of 30?

b. 3 is what percentage of 12?

c. 6 is what percentage of 10?

Possible Solutions

Answers vary. Sample response:

a. 50%. 15 is $\frac{1}{2}$ of 30, so that is 50%.

b. 25%. 3 is $\frac{1}{4}$ of 12, so that is 25%.

c. 60%. $\frac{6}{10}$ is the same as $\frac{3}{5}$, and each $\frac{1}{5}$ is 20%.

Problem 4

Noah says that to find 20% of a number he divides the number by 5. For example, 20% of 60 is 12, because $60 \div 5 = 12$. Does Noah's method always work? Explain why or why not.

Possible Solutions

Yes. Answers vary. Sample response: 20% of a number is $\frac{20}{100}$ times the number and $\frac{20}{100} = \frac{1}{5}$. Multiplying by $\frac{1}{5}$ gives the same result as dividing by 5.

Problem 5

From Grade 6, Unit 3, Lesson 10

Diego has 75% of \$10. Noah has 25% of \$30. Diego thinks he has more money than Noah, but Noah thinks they have an equal amount of money. Who is right? Explain your reasoning.

Possible Solutions

They each have \$7.50 ($10 \cdot 0.75 = 7.50$ and $30 \cdot 0.25 = 7.50$).

Problem 6

From Grade 6, Unit 3, Lesson 8

Lin and Andre start walking toward each other at the same time from opposite ends of 22-mile walking trail. Lin walks at a speed of 2.5 miles per hour. Andre walks at a speed of 3 miles per hour.

Here is a table showing the distances traveled and how far apart Lin and Andre were over time. Use the table to find how much time passes before they meet.

Lesson 13 Practice Problems

elapsed time (hour)	Lin's distance (miles)	Andre's distance (miles)	distance apart (miles)
0	0	0	22
1	2.5	3	16.5
			0

Possible Solutions

4 hours. Possible strategy:

elapsed time (hour)	Lin's distance (miles)	Andre's distance (miles)	distance apart (miles)
0	0	0	22
1	2.5	3	16.5
2	5	6	11
3	7.5	9	5.5
4	10	12	0

Lesson 14 Practice Problems

Problem 1

For each problem, explain or show your reasoning.

a. 160 is what percentage of 40?

b. 40 is 160% of what number?

c. What number is 40% of 160?

Possible Solutions

Reasoning varies. Sample responses:

a. 400%, because $4 \cdot 40 = 160$.

b. 25, because $40 \div 8 = 5$ is 20% of that number, and $5 \cdot 5 = 25$ is 100% of that number.

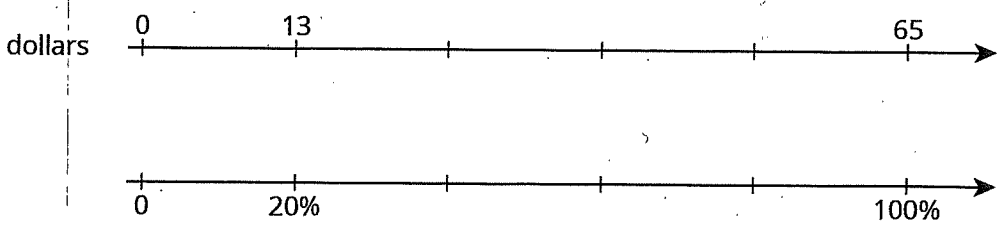
c. 64, because 10% of 160 is 16, and $4 \cdot 16 = 64$.

Problem 2

A store is having a 20%-off sale on all merchandise. If Mai buys one item and saves $13, what was the original price of her purchase? Explain or show your reasoning.

Possible Solutions

$65. Possible reasoning:



Place $13 at 20%. To get from 20% to 100%, multiply by 5. Therefore, also multiply 13 by 5.

Problem 3

The original price of a scarf was $16. During a store-closing sale, a shopper saved $12 on the scarf. What percentage discount did she receive? Explain or show your reasoning.

Possible Solutions

75%. Possible explanations:

- $12 \div 16 = \frac{75}{100}$ (or $12 \div 16 = 0.75$)
-

value (dollars)	percentage
16	100
12	75

Problem 4

Select **all** the expressions whose value is larger than 100.

A. 120% of 100
B. 50% of 150
C. 150% of 50
D. 20% of 800
E. 200% of 30
F. 500% of 400
G. 1% of 1,000

Possible Solutions

A, D, F

Problem 5

From Grade 6, Unit 3, Lesson 8

An ant travels at a constant rate of 30 cm every 2 minutes.

a. At what pace does the ant travel per centimeter?
b. At what speed does the ant travel per minute?

Possible Solutions

a. The pace is $\frac{1}{15}$ of a minute per centimeter.

b. The speed is 15 centimeters per minute.

Problem 6

From Grade 6, Unit 3, Lesson 4

Is $3\frac{1}{2}$ cups more or less than 1 liter? Explain or show your reasoning. (Note: 1 cup $\approx$ 236.6 milliliters)

Possible Solutions

Less. Explanations vary. Possible explanation:

cups	milliliters
1	236.6
0.5	118.3
3	709.8
3.5	828.1

Problem 7

From Grade 6, Unit 3, Lesson 2

Name a unit of measurement that is about the same size as each object.

a. The distance of a doorknob from the floor is about 1 _____.
b. The thickness of a fingernail is about 1 _____.
c. The volume of a drop of honey is about 1 _____.
d. The weight or mass of a pineapple is about 1 _____.
e. The thickness of a picture book is about 1 _____.
f. The weight or mass of a buffalo is about 1 _____.
g. The volume of a flower vase is about 1 _____.
h. The weight or mass of 20 staples is about 1 _____.
i. The volume of a melon is about 1 _____.
j. The length of a piece of printer paper is about 1 _____.

Possible Solutions

a. Yard or meter
b. Millimeter
c. Milliliter
d. Kilogram or pound
e. Centimeter or inch
f. Ton
g. Cup, quart, or liter
h. Gram
i. Gallon
j. Foot

Lesson 15 Practice Problems

Problem 1

a. To find 40% of 75, Priya calculates $\frac{2}{5} \cdot 75$. Does her calculation give the correct value for 40% of 75? Explain or show how you know.

b. If x represents a number, does $\frac{2}{5} \cdot x$ always represent 40% of that number? Explain your reasoning.

Possible Solutions

a. Yes. 40% is 0.4, and $(0.4) \cdot 75 = 30$. Using Priya's method: $\frac{2}{5} \cdot 75 = 30$.

b. Yes. 40% of x is $\frac{40}{100} \cdot x$. This is the same as $\frac{2}{5} \cdot x$, since $\frac{40}{100}$ and $\frac{2}{5}$ are equivalent fractions.

Problem 2

Han spent 75 minutes practicing the piano over the weekend. For each question, explain or show your reasoning.

a. Priya practiced the violin for 152% as much time as Han practiced the piano. How long did she practice?

b. Tyler practiced the clarinet for 64% as much time as Han practiced the piano. How long did he practice?

Possible Solutions

a. 114 minutes. Sample reasoning: 152% of 75 minutes is $\frac{152}{100} \cdot 75 = 114$.

b. 48 minutes. Sample reasoning: 64% of 75 minutes is $\frac{64}{100} \cdot 75 = 48$.

Problem 3

Last Sunday 1,575 people visited the amusement park. 56% of the visitors were adults, 16% were teenagers, and 28% were children ages 12 and under. Find the number of adults, teenagers, and children that visited the park.

Possible Solutions

882 adults, 252 teenagers, and 441 children

Problem 4

Order from greatest to least:

- 55% of 180
- 300% of 26
- 12% of 700

Possible Solutions

55% of 180, 12% of 700, 300% of 26.

Problem 5

From Grade 6, Unit 3, Lesson 14

Complete each statement.

a. 20% of 60 is _____

b. 25% of _____ is 6

c. _____% of 100 is 14

d. 50% of 90 is _____

e. 10% of _____ is 7

f. 30% of 70 is _____

Possible Solutions

a. 12

b. 24

c. 14

d. 45

e. 70

f. 21

Problem 6

From Grade 6, Unit 3, Lesson 9

A shopper needs 24 sandwich rolls. The store sells identical rolls in 2 differently sized packages. They sell a six-pack for $5.28 and a four-pack for $3.40. Should the shopper buy 4 six-packs or 6 four-packs? Explain your reasoning.

Possible Solutions

6 four-packs is a better deal. The rolls in the six-pack are being sold at a rate of 88 cents each, because $5.28 \div 6 = 0.88$. The rolls in the four-pack are being sold at a rate of 85 cents each,

because $3.40 \div 4 = 0.85$. The four-packs are a better deal, because the sandwich rolls have a cheaper unit rate.

Problem 7

From Grade 6, Unit 2, Lesson 15

On a field trip, there are 3 chaperones for every 20 students. There are 92 people on the trip. Answer these questions. If you get stuck, consider using a tape diagram.

a. How many chaperones are there?

b. How many children are there?

Possible Solutions

a. 12

b. 80

Lesson 16 Practice Problems

Problem 1

A sign in front of a roller coaster says "You must be 40 inches tall to ride." What percentage of this height is:

a. 34 inches?

b. 54 inches?

Possible Solutions

a. 85%

b. 135%

Problem 2

At a hardware store, a tool set normally costs $80. During a sale this week, the tool set costs $12 less than usual. What percentage of the usual price is the savings? Explain or show your reasoning.

Possible Solutions

Reasoning varies. Sample response: 15%, because $12 \div 80 = \frac{3}{20} = \frac{15}{100}$.

Problem 3

A bathtub can hold 80 gallons of water. The faucet flows at a rate of 4 gallons per minute. What percentage of the tub will be filled after 6 minutes?

Possible Solutions

30%, because the tub will hold 24 gallons after 6 minutes, and 24 is 30% of 80.

Problem 4

From Grade 6, Unit 3, Lesson 15

The sale price of every item in a store is 85% of its usual price.

a. The usual price of a backpack is $30, what is its sale price?

b. The usual price of a sweatshirt is $18, what is its sale price?

c. The usual price of a soccer ball is $24.80, what is its sale price?

Possible Solutions

a. $25.50

b. $15.30

c. $21.08

Problem 5

From Grade 6, Unit 3, Lesson 9

A shopper needs 48 hot dogs. The store sells identical hot dogs in 2 differently sized packages. They sell a six-pack of hot dogs for $2.10, and an eight-pack of hot dogs for $3.12. Should the shopper buy 8 six-packs, or 6 eight-packs? Explain your reasoning.

Possible Solutions

He should buy 8 six-packs. The hot dogs in the six-pack are being sold at a rate of 35 cents each, because $2.10 \div 6 = 0.35$. The hot dogs in the eight-pack are being sold at a rate of 39 cents each, because $3.12 \div 8 = 0.39$. The six-packs are a better deal, because the hot dogs have a cheaper unit rate.

Problem 6

From Grade 6, Unit 3, Lesson 4

Elena is 56 inches tall.

a. What is her height in centimeters? (Note: 100 inches = 254 centimeters)

b. What is her height in meters?

Possible Solutions

a. 142.24 centimeters

b. 1.42 meters