

Section 1

Key

1. A bird is flying northeast. In the same time it flies $\frac{3}{8}$ mile east, it flies $\frac{5}{6}$ mile north. How many miles does the bird fly east for every mile it travels north?

A $2\frac{2}{9}$ miles east for every mile north

B $\frac{3}{5}$ mile east for every mile north

C $\frac{9}{20}$ mile east for every mile north

D $\frac{5}{16}$ mile east for every mile north

Handwritten work for Question 1:

$$\frac{\text{east}}{\text{North}} = \frac{\frac{3}{8}}{\frac{5}{6}} = \frac{3}{8} \cdot \frac{6}{5} = \frac{18}{40} = \frac{9}{20}$$

2. Add: $8 + (-6)$

A -14

B -2

C 2

D 14

3. Kamal puts \$500 in a savings account that earns simple interest. The interest rate is 5%. How long will it take Kamal to earn \$500 in interest from this account if he makes no other deposit or withdrawal?

A 100 years

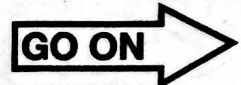
B 25 years

C 20 years

D 0 years

Handwritten work for Question 3:

$$.05 \times 500 = 25$$
$$\frac{500}{25} = 20 \text{ years}$$



Duplicating any part of this book is prohibited by law. © 2013 Multipart Learning, LLC

4. Paula says that she has $\frac{3}{5}$ of her homework left. Mike says he has 0.6 of his homework left. What can you conclude?

Common Conversions

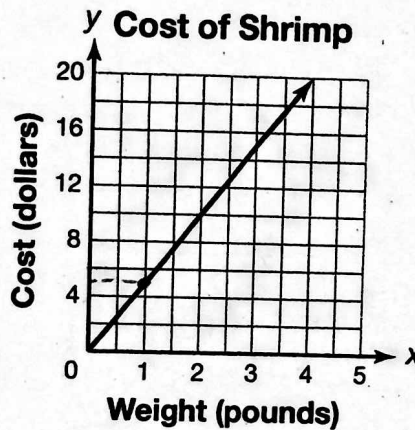
A Paula has less homework to do because $\frac{3}{5} = 0.35$, which is less than 0.6.

B They have the same amount of homework left because $\frac{3}{5} = 0.6$.

C Mike has less homework to do because he has finished more than half, but Paula has finished less than half of the homework.

D Paula has more homework to do because $\frac{3}{5} = 0.53$ and $0.53 > 0.6$.

5. The graph below shows the cost of shrimp at a local market.



Based on this graph, what is the proportionality constant?

unit rate

A 0 because the graph starts at the origin

B 2 because the scale on the y-axis is 2

C 4 because the graph passes through (4, 20)

D 5 because every pound of shrimp costs \$5

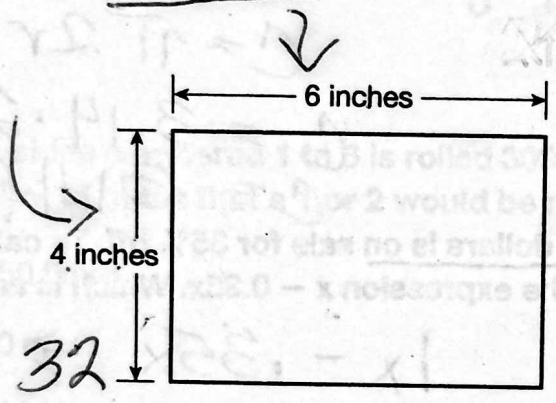


6. Jamal feeds 14.4 pounds of dog food to the 24 dogs at a shelter. Each dog gets the same amount of food. Six of the dogs eat only 0.4 pound of food each. How much food is left in the bowls of these six dogs in all?

- A 0.2 pound
- B 0.6 pound
- C 1.2 pounds**
- D 12 pounds

$14.4 \div 24 = .6$ pound for each dog.
 $6 \text{ eat } .4$
 $6 \times .2 = 1.2$ pounds in all.

7. Nina makes the scale drawing shown of a rectangular room that needs new carpet.



each inch = 8ft

Scale
$\frac{1}{4}$ inch : 2 feet

or

What area will the new carpet cover?

- A 24 square feet
- B 96 square feet
- C 192 square feet
- D 1,536 square feet**

(in) Scale $\frac{1}{4}$ in. = $\frac{4 \text{ in.}}{2 \text{ ft}}$
 $A = lw$ (ft) Actual $32 \text{ ft} \cdot 48 \text{ ft} = 1536$
 $4 \cdot \frac{1}{4} x = 8 \cdot 4$
 $x = 32 \text{ ft}$

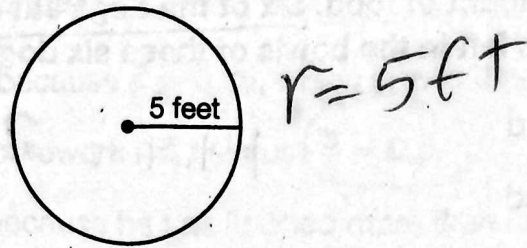
$\frac{\text{(in) Scale}}{\text{(ft) Actual}} = \frac{1 \text{ in}}{8 \text{ ft}} = \frac{6 \text{ in}}{x \text{ ft}}$
 $x \cdot 1 = 48 \cdot 8$
 $x = 384$

$\frac{\text{(in) Scale}}{\text{(ft) Actual}} = \frac{1}{4} \text{ in} = \frac{6 \text{ in}}{x}$
 $4 \cdot 1 = 12 \cdot 4$
 $x = 48$

$\frac{\text{Scale (in)}}{\text{Actual (ft)}} = \frac{1 \text{ in}}{8 \text{ ft}} = \frac{4 \text{ in}}{x \text{ ft}}$
 $x = 32 \text{ ft}$

GO ON

8. Kendrick is putting a border around a circular flowerbed, as shown.



What length of border, in FEET, does Kendrick need? Use 3.14 for π .

- A 15.7 feet
- B 31.4 feet
- C 62.8 feet
- D 78.5 feet

border - Circumference

$$C = \pi 2r$$

$$C = 3.14 \cdot 2 \cdot 5$$

$$C = 31.4 \text{ ft}$$

9. A jacket that regularly costs x dollars is on sale for 35% off. To calculate the sale price of the jacket, Ken uses the expression $x - 0.35x$. Which is an equivalent expression?

- A 0.35
- B $0.65x$
- C $0.65x^2$
- D $1.35x$

$$1x - .35x \rightarrow \begin{array}{r} 1.00x \\ - .35x \\ \hline .65x \end{array}$$

10. Luis and Aisha are running for seventh-grade president. In a random sample of seventh graders, 3 out of 10 students said they would vote for Luis, 4 out of 10 students said they would vote for Aisha, and 3 out of 10 students had not yet decided. If all 450 seventh graders vote in the election, which prediction is the MOST reasonable?

Undecided $\frac{3}{10}$

- A Luis will get 135 votes, and Aisha will get 180 votes.
- B Luis will get 135 votes, and Aisha will get 315 votes.
- C Luis will get 270 votes, and Aisha will get 180 votes.
- D Luis will get 202 votes, and Aisha will get 248 votes.

Luis $\frac{3}{10} = .3 \times 450 = 135$

Aisha $\frac{4}{10} = .4 \times 450 = 180$

NO about other $\frac{3}{10}$

$$\begin{array}{r} 180 \\ + 135 \\ \hline 315 \end{array}$$

$$\begin{array}{r} 450 \\ - 315 \\ \hline 135 \end{array}$$

GO ON

11. Li Ming makes the organized list shown for the possible outcomes of tossing a coin and a number cube at the same time. What is the probability that the coin lands on heads and the number cube lands on 3?

Probability

Heads-1	Tails-1
Heads-2	Tails-2
Heads-3	Tails-3
Heads-4	Tails-4
Heads-5	Tails-5
Heads-6	Tails-6

- A $\frac{1}{12}$
- B $\frac{2}{12}$

- C $\frac{6}{12}$
- D $\frac{7}{12}$

12. A cube with sides numbered 1 to 6 is rolled 300 times. What is the BEST prediction for the number of times that a 1 or 2 would be rolled?

Prob.

- A exactly 50 times
- B about 50 times
- C exactly 100 times
- D about 100 times

13. The measure of an angle is 8 times the measure of its complement. Tina writes an equation and finds the correct measure of each angle. Which shows the equation Tina could have written and the angle measures she could have found?

- A $(x + 8) + x = 90$; 41° and 49°
- B $8x + x = 90$; 80° and 10°
- C $(x + 8) + x = 180$; 86° and 94°
- D $8x + x = 180$; 160° and 20°

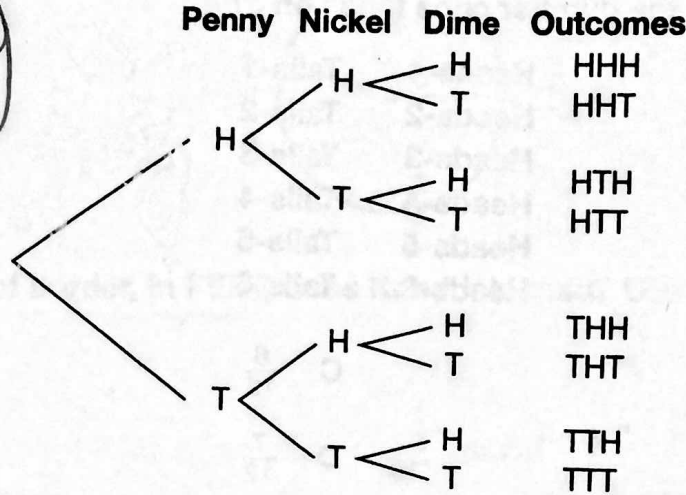
Complement 2 \angle 's sum = 90°
 $\angle 1 + \angle 2 = 90^\circ$
 $x + 8x = 90$
 $\frac{9x}{9} = \frac{90}{9}$
 $x = 10^\circ$

$8x = 80^\circ$
 $8(10) = 80^\circ$

GO ON

14. Steve makes the tree diagram shown to find the possible outcomes of tossing a penny, a nickel, and a dime.

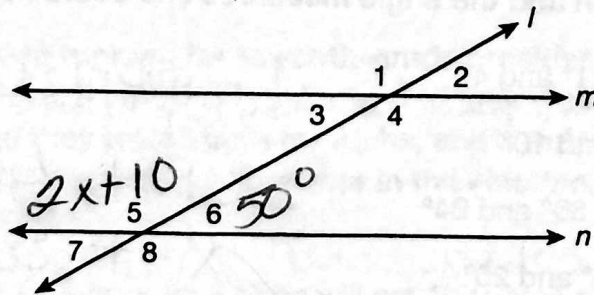
Probability



What is the probability that ALL three coins land on the same side?

- A $\frac{1}{8}$
 B $\frac{1}{4}$
 C $\frac{3}{4}$
 D $\frac{7}{8}$

15. Lines m and n are parallel and are cut by transversal l . Angle 6 has a measure of 50° and angle 5 has a measure of $(2x + 10)^\circ$. Use this information to solve for x .



$$\begin{aligned} \angle 5 + \angle 6 &= 180^\circ \\ 2x + 10 + 50 &= 180 \\ 2x + 60 &= 180 \\ \underline{-60 \quad -60} & \\ 2x &= 120 \\ \underline{\quad \quad 2} & \\ x &= 60 \end{aligned}$$

- A $x = 20$
 B $x = 15$
 C $x = 130$
 D $x = 60$

GO ON

16. Jasmine hangs a painting in the middle of the wall of the store. The wall is $18\frac{1}{4}$ feet long. The painting is $5\frac{1}{4}$ feet wide and $9\frac{1}{2}$ feet tall. She estimates that the painting will need to be about $4\frac{1}{2}$ feet from each edge. Is her estimate reasonable?

- A no, because $18 - 5 = 13$ and $13 \div 2 = 6\frac{1}{2}$
- B no, because $18 \div 2 = 9$ and $9 - 5 = 4$
- C yes, because $9 \div 2 = 4\frac{1}{2}$
- D yes, because $9\frac{1}{2} - 5 = 4\frac{1}{2}$

17. What is the difference of $13.2 - 6.56$?

- A 5.24
- B 6.64
- C 7.36
- D 19.76

$$\begin{array}{r} 13.2 \\ - 6.56 \\ \hline 6.64 \end{array}$$

$$\begin{array}{r} 6\frac{1}{2} \quad 5\frac{1}{4}\text{ft} \quad 6\frac{1}{2} \\ \hline 18\frac{1}{4}\text{ft} \\ - 5\frac{1}{4}\text{ft} \\ \hline 13\text{ft} \div 2 = 6\frac{1}{2} \end{array}$$

18. Which expression is equivalent to $\frac{3}{4} \cdot (x + 12)$?

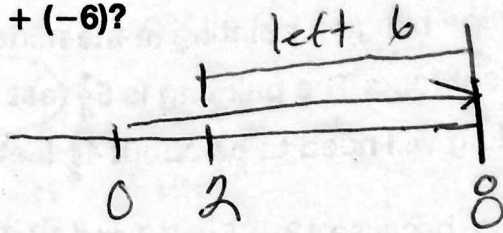
- A $x + 9$
- B $\frac{3}{4}x + \frac{36}{48}$
- C $\frac{3}{4}x + 12$
- D $\frac{3}{4}x + 9$

$$\frac{3}{4} \cdot x + \frac{3}{4} \cdot 12 = \frac{3}{4}x + 9$$



19. How can a number line be used to find $8 + (-6)$?

- A Start at 8. Move 6 units to the right.
- B Start at 8. Move 6 units to the left.
- C Start at 0. Move 6 units left 8 times.
- D Start at 0. Move 8 units right and then 6 units right.



20. The table below shows the distance, d , that a toy car travels over time, t .

unit rate
 $4.9 \div 2$

Time (seconds)	Distance (meters)
2	4.9
4	9.8
6	14.7
8	19.6

$k = \frac{y}{x}$ or $\frac{d}{t}$

$\frac{4.9}{2} = 2.45$

$\frac{9.8}{4} = 2.45$

$\frac{14.7}{6} = 2.45$

$\frac{19.6}{8} = 2.45$

Which equation represents the relationship of distance, d , and time, t , for the car?

- A $d = 4.9t$
- B $d = 2t$
- C $d = 0.41t$
- D $d = 2.45t$

$y = kx$
 $d = kx$
 \downarrow
 $d = 2.45x$

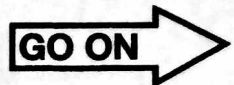
$d = 2.45t$

21. A jacket has a regular price of \$60. It is on sale for 10% off. The sales tax is 8%. What is the TOTAL cost of the jacket including tax?

- A \$49.68
- B \$54.00
- C \$58.32
- D \$97.20

$10 \times 60 = 6.00$
50, $60 \div 6 = 54$
 $\times .08$

$54 + 4.32 = 58.32$ (circled)
4.32 tax
Sale Price



22. Which table shows a proportional relationship between the hours worked and the money earned?

Look for a constant (k).

A

Pay Rate

Time (hours)	Earnings (dollars)
1	$10 \div 1 = 10$
2	$12 \div 2 = 6$
3	$14 \div 3 = 4.6$
4	16

C

Pay Rate

Time (hours)	Earnings (dollars)
1	$5 \div 1 = 5$
2	$10 \div 2 = 5$
3	$20 \div 3 = 6.6$
4	40

B

Pay Rate

Time (hours)	Earnings (dollars)
1	$16 \div 1 = 16$
2	$16 \div 2 = 8$
3	16
4	16

D

Pay Rate

Time (hours)	Earnings (dollars)
1	$8 \div 1 = 8$
2	$16 \div 2 = 8$
3	$24 \div 3 = 8$
4	$32 \div 4 = 8$

23. Which factor makes the equation TRUE?

$$-2 \cdot 3 \cdot \boxed{n} \cdot -4 = -2$$

A $\frac{1}{3}$

B $\frac{1}{12}$

C $-\frac{1}{12}$

D $-\frac{1}{3}$

$$-2 \cdot 3 \cdot -4$$

$$= 6 \cdot -4$$

$$= 24 \cdot \boxed{-\frac{1}{12}} = -2$$
 has to be neg.

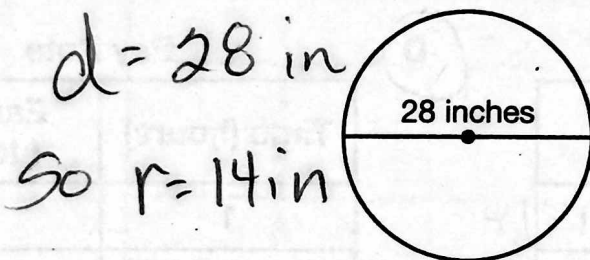


24. The water level in a lake has changed by -16.8 feet over the last 2.5 years. What is the average change in the water level each year?

- A -6.72 feet
B -0.672 feet
C 0.672 feet
D 6.72 feet

$$\frac{-16.8}{2.5} = -6.72 \text{ ft}$$

25. Mr. Franklin makes a round shield for an actor in the school play, as shown. He paints the shield's surface silver.



$$A = \pi r^2$$

$$A = 3.14 \cdot 14 \text{ in} \cdot 14 \text{ in} = 615.44 \text{ in}^2$$

What is the area, in square inches, that Mr. Franklin paints? Use 3.14 for π .

- A 43.96 square inches
B 87.92 square inches
 C 615.44 square inches
D 2,461.76 square inches

26. Rami signs up for a walkathon. Rami's uncle pledges \$10 plus \$1.25 per mile that Rami walks. Rami's uncle will contribute up to a maximum of \$30. How far does Rami need to walk to get the maximum amount from his uncle?

- A 8 miles
- B 16 miles
- C 20 miles
- D 24 miles

$$\begin{array}{r} \$30 = 1.25x + 10 \\ -10 \\ \hline \end{array}$$

$$\frac{20}{1.25} = \frac{1.25x}{1.25}$$

$$16 = x$$

x = # miles

27. What is the probability of rolling a 2 on a number cube?

- A $\frac{1}{6}$
- B $\frac{2}{6}$
- C $\frac{3}{6}$
- D $\frac{5}{6}$

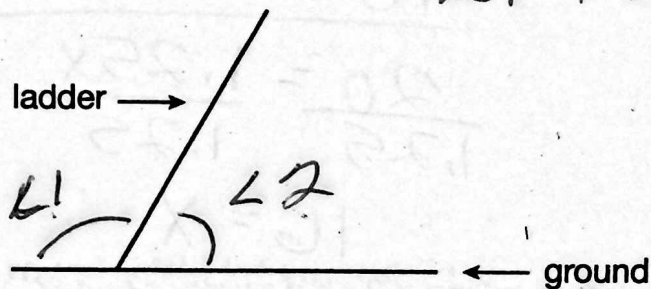
Probability

28. Denise drew a diagram of a slide that she saw, while at a community playground.

Part A:

The ladder for the slide forms two angles with the ground. What type of related angles make up this pair?

$$\angle 1 + \angle 2 = 180^\circ$$



Supplementary Angles

Part B:

The measure of an angle formed by the ladder in Part A is x° . The measure of the other angle is half the measure of the first angle. Write and solve an equation to find the measure of each angle. Show your work.

$$120^\circ + 60^\circ$$

$$\angle 1 + \angle 2 = 180^\circ$$

$$x + \frac{1}{2}x = 180$$

$$\left(1\frac{1}{2}\right)x = 180$$

$$1 = \frac{2 \cdot 3}{3 \cdot 2} x = 180 \cdot \frac{2}{3}$$

$$x = 120^\circ$$

$$\text{So, } \frac{1}{2}x$$

$$\frac{1}{2} \cdot 120 = 60^\circ$$

GO ON

9. Ms. Lorenz is renting a car and can choose from two plans. Plan A costs \$40 each day. Plan B costs \$30 each day plus \$0.40 for each mile she drives. Ms. Lorenz decides that Plan B would cost her less than Plan A.

Part A:

Write and solve an inequality to represent the number of miles, m , Ms. Lorenz will drive.

$$m = \# \text{ miles}$$

$$\begin{array}{l} \$40 \text{ Plan A} \\ 30 + .4m \text{ Plan B} \end{array}$$

$$\begin{array}{r} .4m + 30 < 40 \\ -30 \quad -30 \\ \hline .4m < 10 \end{array}$$

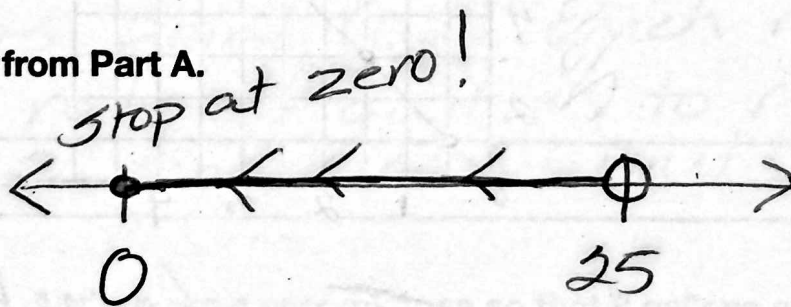
$$\begin{array}{r} .4m < 10 \\ \frac{.4}{.4} \quad \frac{10}{.4} \\ m < 25 \end{array}$$

$$m < 25$$

So, Ms. Lorenz will drive ~~no more~~ less than 25 miles each day.

Part B:

Graph your answer from Part A.



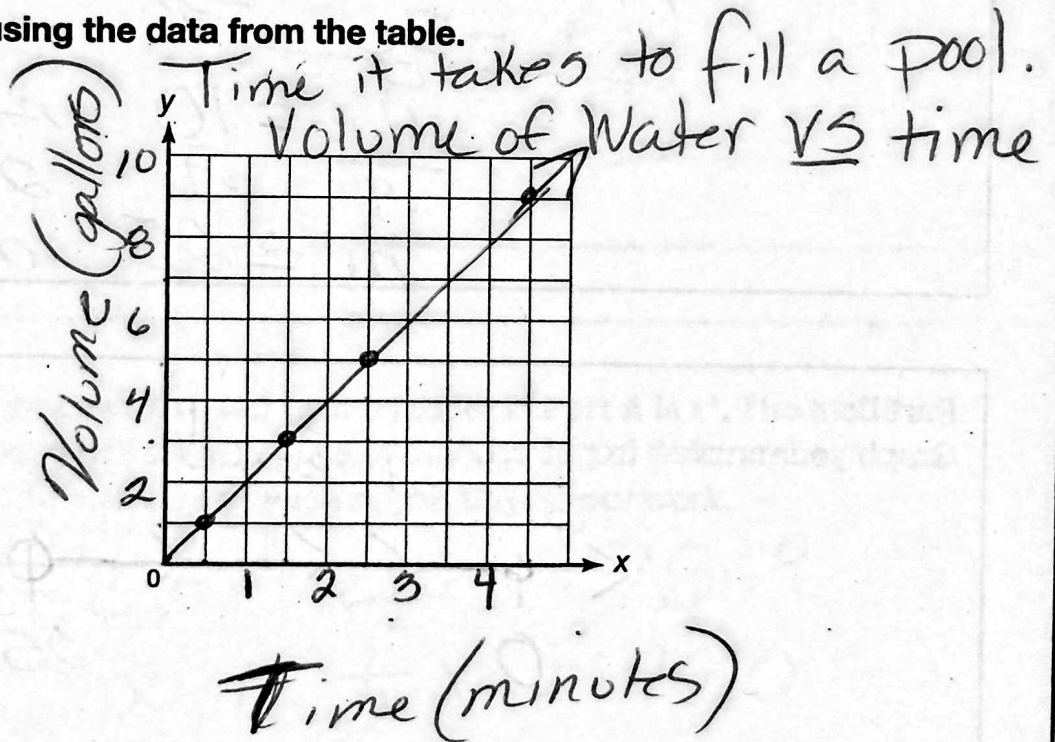
30. Andre fills a small pool from a garden hose. The table below shows the relationship between the time and the volume of water in the pool.

Filling a Pool

Time (minutes)	Volume (gallons)
0.5	1
1.5	3
2.5	5
4.5	9

Part A:

Make a graph using the data from the table.



GO ON 

30. Continued. Please refer to the previous page for task explanation.

Part B:

Based on your graph, are the time and volume proportionally related? Explain how you know.

Yes, because the graph is a straight line that passes through the origin.

Part C:

Based on your graph, what is the unit rate for filling the pool? Explain how you found the unit rate.

The unit rate is 2 gallons per minute. A unit rate is a ratio that has 1 as its second term (denominator). The graph has point (1, 2) which means that the rate of gallons to minutes is $\frac{2}{1}$ or 2. So, 2 is the unit rate.

Part D:

To fill a second pool, Andre uses a second hose so that 8 gallons of water fill the pool each minute. If the pool holds 116 gallons of water, how long does he take to fill the pool? Show all your work.

$$\frac{\text{gallons}}{\text{minutes}} \quad \frac{8}{1} = \frac{116}{x}$$

$$\frac{8x}{8} = \frac{116}{8}$$

$$x = 14.5$$

14.5 minutes

