

Ratios and Proportions: Writing Ratios

A **ratio** is a comparison of two numbers. One way to write a ratio is by using a fraction.

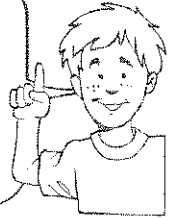
Roberto's football team **won 7 games** and **lost 3 games**. The ratio of games won to games lost is read "**7 to 3**."

What is the ratio of games lost to games won?

Compare: $\frac{\text{games lost}}{\text{games won}} \rightarrow \frac{3}{7}$ The ratio is read "**3 to 7**."

Remember:

The order in which you compare two numbers of a ratio is important.



Write the ratio as a fraction as shown.

1. 5 cheetahs to 7 tigers $\frac{5}{7}$

20 tulips to 13 roses _____

2. 12 trumpets to 5 violins _____

4 taxis to 9 buses _____

3. Jill's 23¢ to Bob's 45¢ _____

10 chairs to 3 tables _____

4. 1 meter to 4 meters _____

3 min. to 25 min. _____

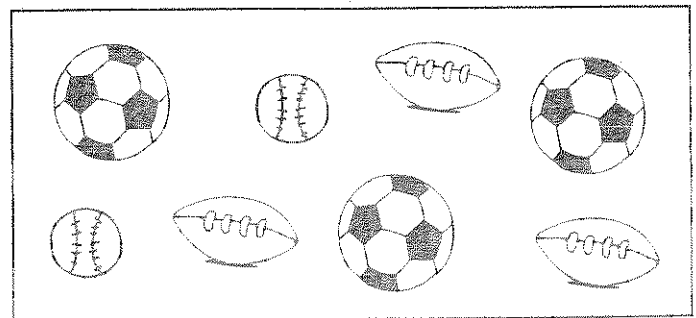
Use the picture. Write a ratio as a fraction for the balls

5. soccer balls to footballs _____

6. baseballs to soccer balls _____

7. footballs to soccer balls _____

8. baseballs to all balls _____



Use the table to find each ratio.

9. Seattle games won to games lost _____

10. Kansas City games won to games played _____

11. Oakland games lost to games played _____

12. Chicago games lost to games won _____

13. Texas games won to games lost _____

Team	Win	Loss
Seattle	49	54
Kansas City	57	47
Oakland	62	42
Chicago	44	60
Texas	56	47



Ratios and Proportions: Equal Ratios

Camille reads **2 books** every **3 weeks**. At that rate, how many books will she read in 12 weeks?

Compare: $\frac{\text{number of books}}{\text{number of weeks}} \rightarrow \frac{2}{3} = \frac{n}{12} \leftarrow \frac{\text{books}}{\text{weeks}}$

$$\frac{2}{3} = \frac{2 \times 4}{3 \times 4} = \frac{8}{12} \quad \text{So, Camille will read } \mathbf{8 \text{ books}}$$
 in 12 weeks.

Find the missing term.

1. $\frac{5}{6} = \frac{n}{36}$

$n = \underline{\hspace{2cm}}$

$\frac{3}{8} = \frac{n}{24}$

$n = \underline{\hspace{2cm}}$

$\frac{5}{7} = \frac{n}{42}$

$n = \underline{\hspace{2cm}}$

$\frac{8}{9} = \frac{n}{63}$

$n = \underline{\hspace{2cm}}$

Use equal ratios to find the value of n .

2. 9 bars of soap for \$3 = n bars of soap for \$9

$n = \underline{\hspace{2cm}}$

4. 10 tickets per child = n tickets per 5 children

$n = \underline{\hspace{2cm}}$

6. 20 people in 4 cars = n people in 8 cars

$n = \underline{\hspace{2cm}}$

8. 4 pounds for 16 people = n pounds for 48 people

$n = \underline{\hspace{2cm}}$

10. 25 miles per gallon of gas = n miles per 10 gallons

$n = \underline{\hspace{2cm}}$

Math Word Problems Warm-ups: Ratios

Name/Date _____

Ratios 1

- A. There are 33 students in the Drama Club and 18 students in the Speech and Debate Club. What is the ratio of Drama Club members to Speech and Debate Club members? _____
- B. There are 15 geese and 7 ducks in the pond. What is the ratio of ducks to geese? _____

Name/Date _____

Ratios 2



- A. Lou loves to read. Over the summer, he read 9 fiction books and 20 nonfiction books. What is his ratio of fiction books to nonfiction books? _____
- B. Emily has 17 shirts, 12 skirts, 5 pairs of pants, and 3 pairs of shoes. What is the ratio of pants to skirts? _____ What is the ratio of pairs of shoes to shirts? _____

Name/Date _____

Ratios 3

On Monday, the students in Mr. Wallace's class bought 12 hot lunches and 9 sack lunches.

- A. What is the ratio of sack lunches to hot lunches? _____
- B. The school cafeteria sold a total of 360 lunches on Monday. Based on the ratio above, how many lunches were hot? _____ sack? _____

The Happy Pet animal shelter houses stray cats and dogs. There are 55 animals at the shelter. The ratio of the number of cats to the number of dogs is 4 to 7.

- C. Based on this ratio, how many animals are dogs? _____
- D. How many animals are cats? _____



Name/Date _____

Ratios 4

Pearson Farm has 18 acres of apple trees, 12 acres of orange trees, and 5 acres of olive trees.

- A. What is the ratio of orange trees to apple trees to olive trees? _____
- B. What is the ratio of olive trees to total acreage? _____

Name/Date _____

Ratios 5

Brad and Alice were both running for student government president. One hundred twenty-eight students voted. The ratio of the number of votes for Alice to the number of votes for Brad was 5 to 3. Based on this ratio, how many students voted for Brad? _____ for Alice? _____

Math Word Problems Warm-ups: Proportions

Name/Date _____

Proportions 1

- A. Perth Middle School is going on a field trip. School policy requires one adult chaperon for every 6 students. There are 360 students. How many chaperons will be needed? _____
- B. The ratio of boys to girls in the marching band is 15:7. If there are 63 girls, how many boys are there? _____

Name/Date _____

Proportions 2

Teresa works for a newspaper. She has a photograph that is 9" high by 12" wide. The photo is too large for the allotted space. She needs to reduce the picture so the height is $4\frac{1}{2}$ ". How wide will the picture be? _____



Name/Date _____

Proportions 3

- A. A roadmap's scale shows 2" equals to 35 miles. Branton and Smallwood are 8" apart. How many miles is it from Branton to Smallwood? _____
- B. Bernice, a caterer, is preparing green beans for 2,330 people. Three pounds serves 12 people. If Bernice prepares 585 pounds of green beans, how many servings will she have left over? _____

Name/Date _____

Proportions 4

Mitchell was making fruit punch. The recipe calls for 3 parts orange juice to 2 parts cranberry juice and 1 part grapefruit juice. Mitchell pours 48 ounces of cranberry juice into a container. How much orange juice and grapefruit juice should he mix with the cranberry juice? _____

Name/Date _____

Proportions 5

- A. A car manufacturer made 278,000 new cars. Two out of five of those cars are hybrids. Based on this ratio, how many of the cars were not hybrids? _____
- B. It takes 4 people 18 days to build 12 computers. If two more people helped, how many days would it probably have taken to build all 12 computers? _____

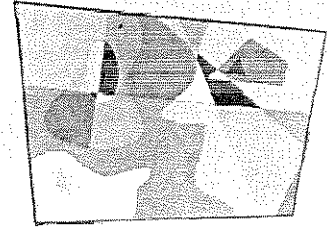
Name _____

Date _____

Unit Rates with Speed and Price - Independent Practice Worksheet

Complete all the problems. Solve using unit rates.

1. Sam can prepare 20 wall paintings in four weeks. How much time will he need to prepare 80 wall paintings?



2. Sonya can walk 6 kilometers in 3 hours. If she has to walk 10 kilometers, how much time will it take her?

3. Tom always keeps his 4 gardens clean. He takes 20 minutes to clean a single garden. How much time will it take to clean all four gardens?

4. Veronica loves to create creative things. She can make 5 craft pieces in 5 days. On the basis of a contract she has to make 20 pieces of crafts. How many days will she take?

5. Brown has his own bakery. He baked 5 cakes per day. Due to the occasion of Christmas, he started to bake 12 cakes per day. In the whole Christmas week how many cakes will he bake?



Name _____

Date _____

6. Mr. White can travel for 6 hours while taking 3 breaks of 10 minutes each. Once, he had to travel for 36 hours. How many minutes in breaks did he take?

7. Sofia learned 10 recipes to create party dishes. She learned these recipes in two weeks. How many recipes can Sofia learn in 5 weeks?

8. In our class, our class teacher gave us a project to complete in 15 days. If the teacher assigned 4 consecutive projects, how many days will you have to complete the projects?

9. Miss Bird is going to launch an exhibition. Miss Bird can make 8 sculptures in 6 months. If she prepared 12 sculptures, how much time would she take?

10. Charles is going to buy 3 computer tables for \$390. If he pays the same rate, how much would it cost for 8 computer tables?



Proportion Problems

Name _____

Instructions: Set up proportions to solve these problems.

1. Mr. Daniels drove 336 miles in eight hours. If he maintains this same speed, how many miles can he drive in 14 hours?



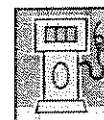
2. An airplane travels 975 miles in three hours. How many hours will it take to go 1300 miles?



3. An umpire records five hits for every twelve boys at bat. If 180 boys come up to bat, how many hits should be made?



4. On a trip of 768 miles, Tonie used 48 gallons of gasoline. How many gallons would be needed to go 1168 miles?



5. If Mario earns \$51 in three weeks, how many weeks will it take him to earn 852?



6. 2700 bricks are needed to build 300 square feet of a wall. How many bricks will be needed to build 1800 square feet of wall?



7. If it takes ten people six hours to assemble 100 Walkmans, how long would it take them to assemble 500 Walkmans?



8. Two out of five high school graduates attend college. If three hundred seventy-five graduate, how many will attend college?



Ratios and Proportions: Writing Ratios

Key

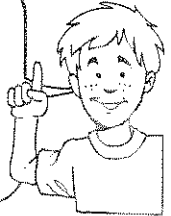
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What is the ratio of games lost to games won?

Compare: $\frac{\text{games lost}}{\text{games won}} \rightarrow \frac{3}{7}$ The ratio is read "3 to 7."

Remember:
The order in which you compare two numbers of a ratio is important.



Write the ratio as a fraction as shown.

1. 5 cheetahs to 7 tigers $\frac{5}{7}$

20 tulips to 13 roses $\frac{20}{13}$

2. 12 trumpets to 5 violins $\frac{12}{5}$

4 taxis to 9 buses $\frac{4}{9}$

3. Jill's 23¢ to Bob's 45¢ $\frac{23}{45}$

10 chairs to 3 tables $\frac{10}{3}$

4. 1 meter to 4 meters $\frac{1}{4}$

3 min. to 25 min. $\frac{3}{25}$

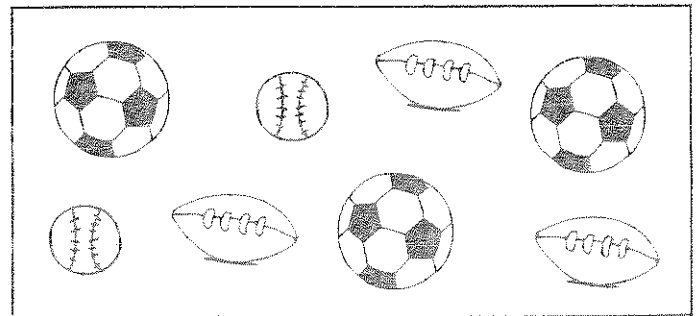
Use the picture. Write a ratio as a fraction for the balls

5. soccer balls to footballs $\frac{3}{3} = \frac{1}{1}$

6. baseballs to soccer balls $\frac{2}{3}$

7. footballs to soccer balls $\frac{3}{3} = \frac{1}{1}$

8. baseballs to all balls $\frac{2}{8} = \frac{1}{4}$



Use the table to find each ratio.

9. Seattle games won to games lost $\frac{49}{54}$

10. Kansas City games won to games played $\frac{57}{104}$

11. Oakland games lost to games played $\frac{42}{104} = \frac{21}{52}$

12. Chicago games lost to games won $\frac{60}{44} = \frac{15}{11}$

13. Texas games won to games lost $\frac{56}{47}$

Team	Win	Loss
Seattle	49	54
Kansas City	57	47
Oakland	62	42
Chicago	44	60
Texas	56	47



Ratios and Proportions: Equal Ratios

Key

Camille reads 2 books every 3 weeks. At that rate, how many books will she read in 12 weeks?

Compare: $\frac{\text{number of books}}{\text{number of weeks}} \rightarrow \frac{2}{3} = \frac{n}{12} \leftarrow \frac{\text{books}}{\text{weeks}}$

$$\frac{2}{3} = \frac{2 \times 4}{3 \times 4} = \frac{8}{12} \quad \text{So, Camille will read 8 books in 12 weeks.}$$

Find the missing term.

$$1. \quad \frac{5 \cdot 6}{6 \cdot 6} = \frac{n}{36}$$

$$n = \underline{30}$$

$$\frac{3 \cdot 3}{8 \cdot 3} = \frac{n}{24}$$

$$n = \underline{9}$$

$$\frac{5 \cdot 6}{7 \cdot 6} = \frac{n}{42}$$

$$n = \underline{30}$$

$$\frac{8 \cdot 7}{9 \cdot 7} = \frac{n}{63}$$

$$n = \underline{56}$$

Use equal ratios to find the value of n .2. 9 bars of soap for \$3 = n bars of soap for \$9

$$n = \underline{27}$$

$$\frac{\text{SOAP}}{\$} \quad \frac{9 \cdot 3}{3 \cdot 3} = \frac{n}{9} \quad n=27$$

4. 10 tickets per child = n tickets per 5 children

$$n = \underline{50}$$

$$\frac{\text{TKT}}{\text{KID}} \quad \frac{10 \cdot 5}{1 \cdot 5} = \frac{n}{5} \quad n=50$$

6. 20 people in 4 cars = n people in 8 cars

$$n = \underline{40}$$

$$\frac{P}{C} \quad \frac{20 \cdot 2}{4 \cdot 2} = \frac{n}{8} \quad n=40$$

8. 4 pounds for 16 people = n pounds for 48 people

$$n = \underline{12}$$

$$\frac{\text{lbs}}{\text{plo.}} \quad \frac{4}{16} = \frac{n}{48} \quad \frac{16n}{16} = \frac{48 \cdot 4}{16} \quad n=12$$

10. 25 miles per gallon of gas = n miles per 10 gallons

$$n = \underline{250}$$

$$\frac{\text{mils}}{\text{gal}} \quad \frac{25 \cdot 10}{1 \cdot 10} = \frac{n}{10} \quad n=250$$

Math Word Problems Warm-ups: Ratios

Key

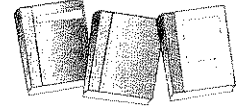
Name/Date _____

Ratios 1

- A. There are 33 students in the Drama Club and 18 students in the Speech and Debate Club. What is the ratio of Drama Club members to Speech and Debate Club members? 33 to 18
- B. There are 15 geese and 7 ducks in the pond. What is the ratio of ducks to geese? 7 to 15

Name/Date _____

Ratios 2



- A. Lou loves to read. Over the summer, he read 9 fiction books and 20 nonfiction books. What is his ratio of fiction books to nonfiction books? 9:20
- B. Emily has 17 shirts, 12 skirts, 5 pairs of pants, and 3 pairs of shoes. What is the ratio of pants to skirts? 5:12 What is the ratio of pairs of shoes to shirts? 3:17

Name/Date _____

Ratios 3

On Monday, the students in Mr. Wallace's class bought 12 hot lunches and 9 sack lunches.

- A. What is the ratio of sack lunches to hot lunches? $\frac{3}{4}$
- B. The school cafeteria sold a total of 360 lunches on Monday. Based on the ratio above, how many lunches were hot? $\frac{12}{21} = \frac{x}{360}$ 205 sack? 155

The Happy Pet animal shelter houses stray cats and dogs. There are 55 animals at the shelter. The ratio of the number of cats to the number of dogs is 4 to 7.

- C. Based on this ratio, how many animals are dogs? 35 $\frac{7}{11} = \frac{x}{55}$
- D. How many animals are cats? 20



Name/Date _____

Ratios 4

Pearson Farm has 18 acres of apple trees, 12 acres of orange trees, and 5 acres of olive trees.

1. What is the ratio of orange trees to apple trees to olive trees? 12:18:5
3. What is the ratio of olive trees to total acreage? 5:35 1:7

Name/Date _____

Ratios 5

Brad and Alice were both running for student government president. One hundred twenty-eight students voted. The ratio of the number of votes for Alice to the number of votes for Brad was 5 to 3. Based on this ratio, how many students voted for Brad? 48 for Alice? 80

128

$$\frac{A}{B} = \frac{5}{3}$$

$$\frac{8}{\text{total } 8} = \frac{x}{128}$$

Math Word Problems Warm-ups: Proportions

KEY

Name/Date _____

Proportions 1

- A. Perth Middle School is going on a field trip. School policy requires one adult chaperon for every 6 students. There are 360 students. How many chaperons will be needed?
- B. The ratio of boys to girls in the marching band is 15:7. If there are 63 girls, how many boys are there?

$$\frac{60}{1} = \frac{x}{360}$$

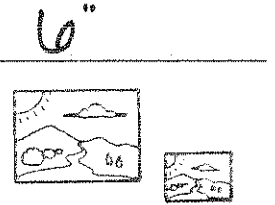
$$\frac{15}{7} = \frac{63}{x}$$

Name/Date _____

Proportions 2

Teresa works for a newspaper. She has a photograph that is 9" high by 12" wide. The photo is too large for the allotted space. She needs to reduce the picture so the height is 4½". How wide will the picture be?

$$\frac{9}{12} = \frac{4.5}{x}$$



Name/Date _____

Proportions 3

- A. A roadmap's scale shows 2" is equals to 35 miles. Branton and Smallwood are 8" apart. How many miles is it from Branton to Smallwood?
- B. Bernice, a caterer, is preparing green beans for 2,330 people. Three pounds serves 12 people. If Bernice prepares 585 pounds of green beans, how many servings will she have left over?

$$\frac{2}{35} = \frac{8}{x}$$

$$\frac{3}{12} = \frac{585}{x}$$

Name/Date _____

Proportions 4

Mitchell was making fruit punch. The recipe calls for 3 parts orange juice to 2 parts cranberry juice and 1 part grapefruit juice. Mitchell pours 48 ounces of cranberry juice into a container. How much orange juice and grapefruit juice should he mix with the cranberry juice?

$$\frac{3}{2} = \frac{x}{48}$$

$$\frac{1}{2} = \frac{y}{48}$$

Name/Date _____

Proportions 5

- A. A car manufacturer made 278,000 new cars. Two out of five of those cars are hybrids. Based on this ratio, how many of the cars were not hybrids?
- B. It takes 4 people 18 days to build 12 computers. If two more people helped, how many days would it probably have taken to build all 12 computers?

$$\frac{2}{5} = \frac{x}{278000}$$

$$\frac{4}{18} = \frac{6}{x}$$

$$\frac{2}{35} = \frac{8}{140}$$

$$\frac{3}{2} = \frac{72}{48}$$

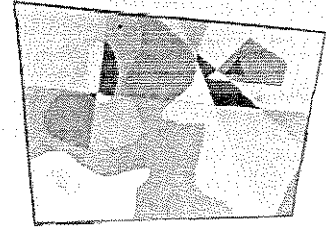
$$\frac{1}{2} = \frac{24}{48}$$

$$\frac{2}{5} = \frac{x}{278000}$$

Unit Rates with Speed and Price - Independent Practice Worksheet

Complete all the problems. Solve using unit rates.

1. Sam can prepare 20 wall paintings in four weeks. How much time will he need to prepare 80 wall paintings?



$$\frac{P}{W} \quad \frac{20 \cdot 4}{4 \cdot 4} = \frac{80}{X}$$

16 weeks

2. Sonya can walk 6 kilometers in 3 hours. If she has to walk 10 kilometers, how much time will it take her?

$$\frac{Km}{h} \quad \frac{6}{3} = \frac{10}{X}$$

$$\begin{aligned} 6X &= 3 \cdot 10 \\ \frac{6X}{6} &= \frac{30}{6} \\ X &= 5 \end{aligned}$$

5 hrs

3. Tom always keeps his 4 gardens clean. He takes 20 minutes to clean a single garden. How much time will it take to clean all four gardens?

$$\frac{\text{min}}{\text{gar}} \quad \frac{20 \cdot 4}{1 \cdot 4} = \frac{X}{4}$$

80 min or 1hr 20 min.

4. Veronica loves to create creative things. She can make 5 craft pieces in 5 days. On the basis of a contract she has to make 20 pieces of crafts. How many days will she take?

$$\frac{5 \text{ crafts}}{5 \text{ days}} = \frac{20}{X}$$

X = 20 days

5. Brown has his own bakery. He baked 5 cakes per day. Due to the occasion of Christmas, he started to bake 12 cakes per day. In the whole Christmas week how many cakes will he bake?

$$\frac{\text{cakes}}{\text{day}} \quad \frac{12 \cdot 7}{1 \cdot 7} = \frac{X}{7}$$

X = 84 cakes



Name _____

Date _____

6. Mr. White can travel for 6 hours while taking 3 breaks of 10 minutes each. Once, he had to travel for 36 hours. How many minutes in breaks did he take?

$$\frac{\text{hr}}{\text{break}} \frac{6}{3} = \frac{36}{x}$$

$$x = 18 \text{ breaks} \\ \frac{.10 \text{ min}}{180}$$

180 min.

7. Sofia learned 10 recipes to create party dishes. She learned these recipes in two weeks. How many recipes can Sofia learn in 5 weeks?

$$\frac{\text{rec.}}{\text{wk}} \frac{10}{2} = \frac{x}{5}$$

$$\frac{2x = 50}{2} \\ x = 25$$

25 recipes

8. In our class, our class teacher gave us ¹ a project to complete in 15 days. If the teacher assigned 4 consecutive projects, how many days will you have to complete the projects?

$$\frac{\text{proj}}{\text{days}} \frac{1}{15} = \frac{4}{x}$$

x = 60 days

9. Miss Bird is going to launch an exhibition. Miss Bird can make 8 sculptures in 6 months. If she prepared 12 sculptures, how much time would she take?

$$\frac{s}{\text{mon}} \frac{8}{6} = \frac{12}{x}$$

$$8x = 6 \cdot 12 \\ \frac{8x = 72}{8} \\ x = 9$$

9 months

10. Charles is going to buy 3 computer tables for \$390. If he pays the same rate, how much would it cost for 8 computer tables?

$$\frac{\text{tab.}}{\$} \frac{3}{390} = \frac{8}{x}$$

$$3x = 8 \cdot 390 \\ \frac{3x = 3120}{3} \\ x = 1040$$

\$1040



Proportion Problems

Name _____

Key

Instructions: Set up proportions to solve these problems.

1. Mr. Daniels drove 336 miles in eight hours. If he maintains this same speed, how many miles can he drive in 14 hours?

$$\frac{m}{hr} = \frac{336}{8} = \frac{x}{14}$$

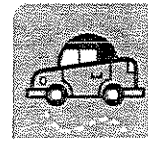
$$8x = 14 \cdot 336$$

$$8x = 4704$$

$$\frac{8x}{8} = \frac{4704}{8}$$

$$x = 588$$

Mr. Daniels can drive 588 miles in 14 hr.



2. An airplane travels 975 miles in three hours. How many hours will it take to go 1300 miles?

$$\frac{m}{h} = \frac{975}{3} = \frac{1300}{x}$$

$$975x = 1300 \cdot 3$$

$$975x = 3900$$

$$x = 4$$

It will take the plane 4 hrs



3. An umpire records five hits for every twelve boys at bat. If 180 boys come up to bat, how many hits should be made?

$$\frac{h}{b} = \frac{5}{12} = \frac{x}{180}$$

$$12x = 5 \cdot 180$$

$$12x = 900$$

$$\frac{12x}{12} = \frac{900}{12}$$

$$x = 75$$

The umpire should expect 75 hits.



4. On a trip of 768 miles, Tonie used 48 gallons of gasoline. How many gallons would be needed to go 1168 miles?

$$\frac{m}{g} = \frac{768}{48} = \frac{1168}{x}$$

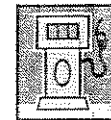
$$768x = 1168 \cdot 48$$

$$768x = 56064$$

$$\frac{768x}{768} = \frac{56064}{768}$$

$$x = 73$$

Tonie needs 73 gal.



5. If Mario earns \$51 in three weeks, how many weeks will it take him to earn 852?

$$\frac{\$}{w} = \frac{51}{3} = \frac{852}{x}$$

$$51x = 852 \cdot 3$$

$$51x = 2556$$

$$\frac{51x}{51} = \frac{2556}{51}$$

$$x = 50.11$$

It would take 51 weeks.

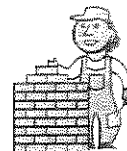


6. 2700 bricks are needed to build 300 square feet of a wall. How many bricks will be needed to build 1800 square feet of wall?

$$\frac{b}{ft} = \frac{2700}{300} = \frac{x}{1800}$$

$$x = 16,200$$

16,200 bricks are needed.

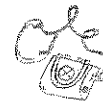


7. If it takes ten people six hours to assemble 100 Walkmans, how long would it take them to assemble 500 Walkmans?

$$\frac{hr}{p} = \frac{6}{10} = \frac{x}{500}$$

$$x = 30$$

It would take them 30 hrs.



8. Two out of five high school graduates attend college. If three hundred seventy-five graduate, how many will attend college?

$$\frac{grad}{grad} = \frac{2}{5} = \frac{x}{375}$$

$$5x = 2 \cdot 375$$

$$5x = 750$$

$$\frac{5x}{5} = \frac{750}{5}$$

$$x = 150$$

150 will attend college.



