

Fraction Word Problems (Multiplication/Division)

When solving word problems, make sure to UNDERSTAND THE QUESTION. Look for bits of information that will help get to the answer. Keep in mind that some sentences may not have key words or key words might even be misleading. USE COMMON SENSE when thinking about how to solve word problems. The first thing you think of might be the best way to solve the problem.

Here are some KEY WORDS to look for in word problems:

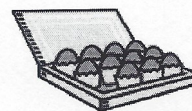
Product, times: mean to multiply

Quotient, per, for each, average: mean to divide

Ex. 1: If 3 boxes of candy weigh $6\frac{1}{2}$ pounds, find the weight per box.

“per” means to divide

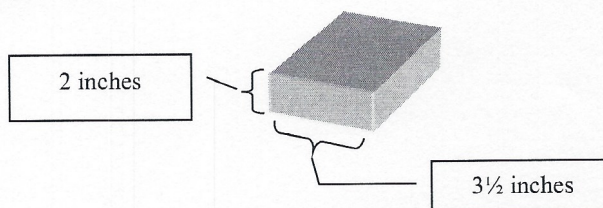
$$6\frac{1}{2} \div 3 = \frac{13}{2} \div \frac{3}{1} = \frac{13}{2} \times \frac{1}{3} = \frac{13}{6} = 2\frac{1}{6} \text{ pounds}$$



Ex. 2: If one “2 by 4” is actually $3\frac{1}{2}$ inches wide, find the width of twelve “2 by 4”s.

twelve 2” by 4”s here means 12 times as wide as one 2” by 4”

$$3\frac{1}{2} \times 12 = \frac{7}{2} \times \frac{12}{1} = 42 \text{ inches}$$



Exercise 5 (answers on page 40)

Solve the following fraction word problems. Cancel and simplify your answers.

1. A stack of boards is 21 inches high. Each board is $1\frac{3}{4}$ inches thick. How

Bigger to smaller
 ↓
Division
 many boards are there? **THERE ARE 12 BOARDS**
 the total height is 21 inches, containing boards of $1\frac{3}{4}$ inches each... therefore.

$$21 \div 1\frac{3}{4} = \frac{21}{1} \div \frac{7}{4} \Rightarrow \left(\frac{21}{1} \times \frac{4}{7} = \frac{21 \times 4}{1 \times 7} = \frac{84}{7} = 12 \right)$$

2. A satellite makes 4 revolutions of the earth in one day. How many revolutions would it make in $6\frac{1}{2}$ days? **26 Revolution**

Smaller to bigger
 ↓
Multiplication
 If in 1 day, a satellite 4 revolutions, then 6.5 days has to be greater than 4 \Rightarrow Multiplication.

$$(6.5 \text{ days}) \times 4 = 26$$

3. A bolt has $16\frac{1}{2}$ turns per inch. How many turns would be in $2\frac{1}{2}$ inches of threads?

$$\frac{33}{2} \times \frac{5}{2} = \frac{33 \times 5}{4} = \frac{165}{4} \approx 41.25 \text{ turns}$$

The word "per" indicates multiplication. Also, 1 inch has $16\frac{1}{2}$ turns. $2\frac{1}{2}$ inches has to be more \Rightarrow Multiplication

$$\frac{33}{2} \times \frac{5}{2} = \frac{33 \times 5}{4} = \frac{165}{4}$$

4. If a bookshelf is $28\frac{1}{8}$ inches long, how many $1\frac{7}{8}$ inch thick books will it hold?

28 $\frac{1}{8}$ = $\frac{225}{8}$ $1\frac{7}{8} = \frac{15}{8}$
 A shelf is bigger, so we divide.

$$\frac{225}{8} \div \frac{15}{8} = \frac{225 \times 8}{15 \times 8} = 15 \text{ BOOKS}$$

5. Deborah needs to make 16 costumes for the school play. Each costume requires $2\frac{1}{4}$ yards of material. How many yards of material will she need?

$2\frac{1}{4} = \frac{9}{4}$
 If each costume, requires $\frac{9}{4}$ yards, then to 16 costumes is

$$16 \text{ costumes} \times \frac{9}{4} = \frac{144}{4} = 36 \text{ yards}$$

6. The Coffee Pub has cans of coffee that weigh $3\frac{1}{4}$ pounds each. The Pub

has $8\frac{1}{2}$ cans of coffee left. What is the total weight of $8\frac{1}{2}$

cans? $8\frac{1}{2} = \frac{17}{2}$ cans left. Each can weigh $3\frac{1}{4} = \frac{13}{4}$ lbs

Each can weights $\frac{13}{4}$ lbs. then, $\frac{17}{2}$ cans weigh:

$$\frac{17}{2} \times \frac{13}{4} \text{ lbs} = \frac{17 \times 13}{2 \times 4} = \frac{221}{8} \text{ lbs/can} = 27.625 \text{ lbs}$$

7. Belinda baked 9 pies that weigh $20\frac{1}{4}$ pounds total. How much does each

pie weigh? The total weigh $20\frac{1}{4} = \frac{81}{4}$ lbs. This weigh is distributed among 9 pies \rightarrow so divide

$$\frac{81}{4} \div 9 = \frac{81 \times 1}{4 \times 9} = \frac{81}{36} = 2.25 \text{ lbs per pie}$$

8. A piece of paper is $\frac{4}{1000}$ inches thick. How many sheets of paper will it

take to make a stack 1 inch high?

Each paper is $\frac{4}{1000}$ (this is less than 1), so we are trying to see how many can stack up in 1 inch. \Rightarrow Divide $\frac{1}{\frac{4}{1000}} = \frac{1000}{4} = 250$ sheets

9. Tanya has read $\frac{3}{4}$ of a book, which is 390 pages. How many pages are in

the entire book?

If 390 are the $\frac{3}{4}$, then 390 is/represents 3 out of 4 parts... so

$$390 \div 3 \text{ would get every } \frac{1}{4} = 130 \quad \frac{390}{3} = 130$$

Now, each quarter is (130 pages) $\rightarrow (130) \times 4 = 520$ pages

10. DJ Gabe is going to serve $\frac{1}{3}$ of a whole pizza to each guest at his party. If he expects 24 guests, how many pizzas will he need?

Each guest — $\frac{1}{3}$ whole pizza
24 guests — ?

$$\text{Total amount of pizzas} = 24 \times \frac{1}{3} = \frac{24}{3} = 8 \text{ pizzas}$$

LEVEL SIX:

1. Gerald bought $\frac{5}{6}$ pound of candy at one store and $\frac{3}{4}$ pound of candy at another store. How much total candy did Gerald buy?

Add

$$\frac{5}{6} + \frac{3}{4}$$

$$\downarrow \quad \downarrow$$

$$\frac{10}{12} + \frac{9}{12} = \frac{19}{12} = 1\frac{7}{12} \text{ lb of candy}$$

2. Bethany ordered 12 pizzas for a party. If each person eats $\frac{3}{8}$ of a pizza, how many people can George feed with 12 pizzas?

Cutting Pizza \rightarrow
Divide

$$12 \div \frac{3}{8}$$

$$\frac{4\cancel{12}}{1} \cdot \frac{8}{\cancel{3}} = 32 \text{ people}$$

3. The recipe says takes $2\frac{1}{2}$ cups of flour to bake a batch of cookies. Sherry wants to bake $3\frac{3}{4}$ batches of cookies. How many cups of flour will Sherry need?

Multiply

$$2\frac{1}{2} \cdot 3\frac{3}{4}$$

$$\frac{5}{2} \cdot \frac{15}{4} = \frac{75}{8} = 9\frac{3}{8} \text{ cups of flour}$$

4. The milk carton had $\frac{8}{9}$ gallons in it before Stu took a drink. If he drank $\frac{1}{12}$ of a gallon, how much milk is left?

Subtract

$$\frac{8}{9} - \frac{1}{12}$$

$$\downarrow$$

$$\frac{32}{36} - \frac{3}{36} = \frac{29}{36} \text{ gallon left}$$

5. What is $\frac{4}{5}$ of $6\frac{3}{7}$?

$$6\frac{3}{7} \cdot \frac{4}{5}$$

$$9\frac{45}{7} \cdot \frac{4}{8} = \frac{36}{7} = 5\frac{1}{7}$$

6. How many $\frac{3}{4}$ are in 6?

$$6 \div \frac{3}{4}$$

$$\frac{2\cancel{6}}{1} \cdot \frac{4}{\cancel{3}} = \frac{8}{1} = 8$$