Division with Fractions

Extend Your Learning
Answers and Explanations

Solve each problem. You may want to draw a diagram to help you. Estimate the answer before beginning the solution.

1. A rectangular pasture is $\frac{1}{3}$ mile wide. If the total area of the pasture is 2 square miles, how long is the pasture?

Why is this a division situation?
You can find the area of a rectangle by multiplying the length times the width (A = l x w). You know the area and the width of this pasture, so you can find the length by dividing.
How can you solve the problem in a way that makes sense?
The pasture is 1/3 mile wide and has an area of 2 square miles. How many thirds are in one? There are three thirds in one. How many thirds are in two? There are six thirds in two.
How do you interpret the answer?
The pasture measures 1/3 mile by 6 miles and has an area of 2 square miles.

Another pasture is $\frac{2}{3}$ mile wide. If it has the same area, what is its length?

Why is this a division situation?
You can find the area of a rectangle by multiplying the length times the width (A = l x w). You know the area and the width of this pasture, so you can find the length by dividing.
How can you solve the problem in a way that makes sense?
There are three thirds in one and six thirds in two. There are half as many two thirds in two as there are one thirds. One half of six is three.
How do you interpret the answer?
The pasture measures 2/3 miles by 3 miles and has an area of 2 square miles.

2. Skylar has $1\frac{1}{2}$ cups of cheese. The casserole recipe calls for $\frac{3}{8}$ cup of cheese. How many casseroles can he make if he uses all the cheese?

Why is this a division situation?
We need to find how many three eighths are in 1½.
How can you solve the problem in a way that makes sense?
Ask yourself, "How many eighths are in 1 cup?" There are eight. How many eighths are in 1½ cups? There are 12. Since we need to group the eighths by threes to have three eighths in each group, we need to divide 12 by three (12 ÷ 3 = 4).
How do you interpret the answer?
There are four 3/8 cups in 1½ cups. Skylar can make four casseroles with the cheese.

3. Michael can paint a mailbox in $\frac{1}{5}$ hour. How many mailboxes can he paint in 5 hours?

Why is this a division situation?
We need to find how many fifths are in 5 hours.
How can you solve the problem in a way that makes sense?
There are five fifths in one hour, so we can multiply by 5 hours. Five fifths of an hour times 5 hours equals 25 fifths of an hour. There are 25 fifths in 5 hours.
How do you interpret the answer?
Since Michael can paint one mailbox in 1/5 hour and there are 25 fifths in 5 hours, he can paint 25 mailboxes in 5 hours.

His friend, Jacob, can paint a mailbox in $\frac{3}{5}$ hour. Working together, how many mailboxes can they paint in 5 hours?

Why is this a division situation?
We already know that Michael can paint 25 mailboxes in 5 hours, so we need to find how many mailboxes Jacob can paint in the same amount of time. We already found that there are 25 fifths in 5 hours. However, Jacob takes much longer than Michael to paint a mailbox. He needs 3/5 of an hour, so we need to find how many three fifths are in 5 hours.
How can you solve the problem in a way that makes sense?
Twenty five divided by three is 8 1/3, so Jacob can paint 8 1/3 mailboxes in 5 hours.
How do you interpret the answer?
Since we want to know how many mailboxes Jacob and Michael can paint while working together, we need to add Jacob's amount to Michael's amount. Eight and one-third mailboxes plus 25 mailboxes equals 33 1/3 mailboxes. Together they can paint 33 1/3 mailboxes.

4. The teacher bought five medium pizzas for her helpers. If every helper ate $\frac{5}{6}$ of a pizza and all the pizzas were eaten, how many helpers did she have?

Why is this a division situation?
We need to find how many five sixths are in five pizzas.
How can you solve the problem in a way that makes sense?
We already know there are six sixths in one pizza, so in five pizzas there are 30 sixths. Six sixths per pizza times five pizzas equals 30 sixths. Since each helper ate five sixths, we need to find how many five sixths are in 30 sixths. We can do this by dividing 30 by 5. Since 30 ÷ 5 = 6, there are six helpers.
How do you interpret the answer?
The teacher had six helpers.