

Some proportions require more algebra to solve.

EXAMPLE B | Solve $\frac{306}{24} = \frac{x + 50}{20}$.

► **Solution**

$$\frac{306}{24} = \frac{x + 50}{20}$$

Original proportion.

$$20 \cdot \frac{306}{24} = x + 50$$

Multiply both sides by 20.

$$255 = x + 50$$

Multiply and divide on the left side.

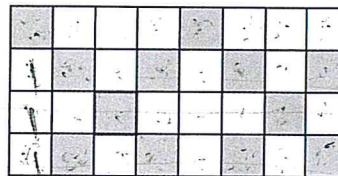
$$205 = x$$

Subtract 50 from both sides.

EXERCISES

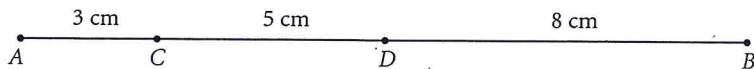
1. Look at the rectangle at right. Find the ratio of the shaded area to the area of the whole figure. Find the ratio of the shaded area to the unshaded area.

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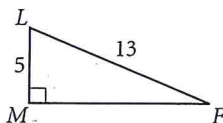
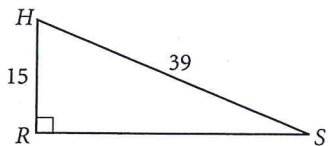


2. Use the figure below to find these ratios: $\frac{AC}{CD}$, $\frac{CD}{BD}$, and $\frac{BD}{BC}$.

10:20



3. Consider these triangles.



- a. Find the ratio of the perimeter of $\triangle RSH$ to the perimeter of $\triangle MFL$.
 b. Find the ratio of the area of $\triangle RSH$ to the area of $\triangle MFL$.

In Exercises 4–12, solve the proportion.

4. $\frac{7}{21} = \frac{a}{18}$

5. $\frac{10}{b} = \frac{15}{24}$

6. $\frac{20}{13} = \frac{60}{c}$

7. $\frac{4}{5} = \frac{x}{7}$

8. $\frac{2}{y} = \frac{y}{32}$

9. $\frac{14}{10} = \frac{x + 9}{15}$

10. $\frac{10}{10 + z} = \frac{35}{56}$

11. $\frac{d}{5} = \frac{d + 3}{20}$

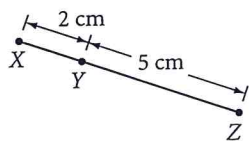
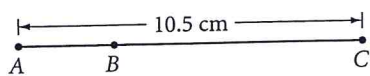
12. $\frac{y}{y + 2} = \frac{15}{21}$

13. Solve this proportion for x . Assume $c \neq 0$ and $z \neq 0$.

$$\frac{x}{c} = \frac{b}{z}$$

In Exercises 14–17, use a proportion to solve the problem.

14. **APPLICATION** A car travels 106 miles on 4 gallons of gas. How far can it go on a full tank of 12 gallons?
15. **APPLICATION** Ernie is a baseball pitcher. He gave up 34 runs in 152 innings last season. What is Ernie's earned run average—the number of runs he would give up in 9 innings? Give your answer accurate to two decimal places.
16. **APPLICATION** The floor plan of a house is drawn to the scale of $\frac{1}{4}$ in. = 1 ft. The master bedroom measures 3 in. by $3\frac{3}{4}$ in. on the blueprints. What is the actual size of the room?
17. Altor and Zenor are ambassadors from Titan, the largest moon of Saturn. The sum of the lengths of any Titan's antennae is a direct measure of that Titan's age. Altor has antennae with lengths 8 cm, 10 cm, 13 cm, 16 cm, 14 cm, and 12 cm. Zenor is 130 years old, and her seven antennae have an average length of 17 cm. How old is Altor?
18. Assume $\frac{AB}{XY} = \frac{BC}{YZ}$. Find AB and BC .



IMPROVING YOUR ALGEBRA SKILLS

Algebraic Magic Squares II

In this algebraic magic square, the sum of the entries in every row, column, and diagonal is the same. Find the value of x .

$8 - x$	15	14	$11 - x$
12	$x - 1$	x	9
8	$x + 3$	$x + 4$	5
$2x - 1$	3	2	$2x + 2$

