Proportional Ratios

Name: _____	Date: _____	Score: _____ / 18

Quick Review and Helpful Hints

Two ratios are *proportional* when they are equal, like $\frac{a}{b} = \frac{c}{d}$. The fastest way to work with a proportion is *cross-multiplication*: multiply each numerator by the other denominator. To find a missing value, cross-multiply and then divide to isolate the variable.

▷ **Example:** Solve the proportion $\frac{3}{4} = \frac{x}{20}$. **Work:** Cross-multiply: $4 \cdot x = 3 \cdot 20$, which gives $4x = 60$. Divide both sides by 4: $x = \frac{60}{4} = 15$.

★ **Answer:** $x = 15$

Practice Problems

Solve each proportion for the variable.

1. $\frac{2}{3} = \frac{x}{9}$ _____

2. $\frac{5}{6} = \frac{x}{12}$ _____

3. $\frac{x}{4} = \frac{9}{12}$ _____

4. $\frac{7}{x} = \frac{14}{10}$ _____

5. $\frac{3}{5} = \frac{12}{x}$ _____

6. $\frac{4}{9} = \frac{x}{27}$ _____

7. $\frac{x}{8} = \frac{15}{24}$ _____

8. $\frac{6}{7} = \frac{18}{x}$ _____

9. $\frac{10}{x} = \frac{5}{4}$ _____

10. $\frac{x}{15} = \frac{4}{5}$ _____

11. $\frac{8}{12} = \frac{x}{15}$ _____

12. $\frac{9}{x} = \frac{3}{2}$ _____

13. $\frac{x}{6} = \frac{14}{21}$ _____

14. $\frac{5}{8} = \frac{x}{40}$ _____

Word Problems

15. A car travels 150 miles on 5 gallons of gas. At the same rate, how far can it travel on 8 gallons? _____

16. A photo 4 inches wide and 6 inches tall is enlarged so its width becomes 10 inches. Keeping the same proportions, what is the new height? _____

17. If 3 notebooks cost $\$7.50$, how much do 7 notebooks cost at the same price? _____

18. On a map, 2 inches represents 30 miles. How many miles do 5 inches represent? _____

Scan Me

Answer Keys

1. $x = 6$	**7.** $x = 5$	**13.** $x = 4$
2. $x = 10$	**8.** $x = 21$	**14.** $x = 25$
3. $x = 3$	**9.** $x = 8$	**15.** 240 miles
4. $x = 5$	**10.** $x = 12$	**16.** 15 inches
5. $x = 20$	**11.** $x = 10$	**17.** $\$17.50$
6. $x = 12$	**12.** $x = 6$	**18.** 75 miles

Step-by-Step Explanations

1. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Multiply diagonally – equal fractions always have equal cross-products: $3x = 2 \cdot 9 = 18$, so $x = 6$. So the final answer is $x = 6$.

2. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Set the cross-products equal: $6x = 5 \cdot 12 = 60$, then divide by 6 to find $x = 10$. So the final answer is $x = 10$.

3. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Even with x on top, the rule is the same: $12x = 4 \cdot 9 = 36$, so $x = 3$. So the final answer is $x = 3$.

4. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is When x sits in a denominator, cross-multiply anyway: $14x = 7 \cdot 10 = 70$, giving $x = 5$. So the final answer is $x = 5$.

5. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Cross-multiply and solve: $3x = 5 \cdot 12 = 60$, so $x = 20$. So the final answer is $x = 20$.

6. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is The diagonal products are equal: $9x = 4 \cdot 27 = 108$, then $x = 12$. So the final answer is $x = 12$.

7. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Multiply across the equals sign: $24x = 8 \cdot 15 = 120$, so $x = 5$. So the final answer is $x = 5$.

8. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Cross-multiply: $6x = 7 \cdot 18 = 126$, giving $x = 21$. So the final answer is $x = 21$.

9. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Set the cross-products equal: $5x = 10 \cdot 4 = 40$, so $x = 8$. So the final answer is $x = 8$.

10. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Cross-multiply: $5x = 15 \cdot 4 = 60$, then $x = 12$. So the final answer is $x = 12$.

11. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Multiply diagonally: $12x = 8 \cdot 15 = 120$, so $x = 10$. So the final answer is $x = 10$.

12. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is The cross-products match: $3x = 9 \cdot 2 = 18$, giving $x = 6$. So the final answer is $x = 6$.

13. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Cross-multiply: $21x = 6 \cdot 14 = 84$, so $x = 4$. So the final answer is $x = 4$.

14. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Set the cross-products equal: $8x = 5 \cdot 40 = 200$, then $x = 25$. So the final answer is $x = 25$.

15. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Write miles over gallons and keep the units lined up: $\frac{150}{5} = \frac{x}{8}$. Cross-multiply: $5x = 1200$, so $x = 240$ miles. So the final answer is 240 miles.

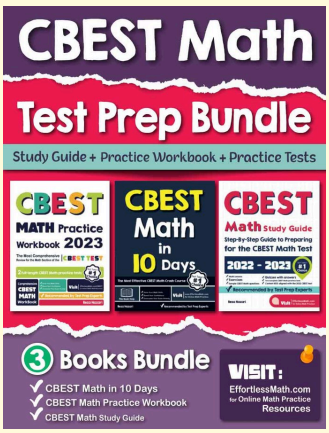
16. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Keep width over height the same: $\frac{4}{6} = \frac{10}{x}$. Cross-multiply: $4x = 60$, so the new height is 15 inches. So the final answer is 15 inches.

17. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Set notebooks over cost equal: $\frac{3}{7.50} = \frac{7}{x}$. Cross-multiply: $3x = 52.5$, so $x = \$17.50$. So the final answer is $\$17.50$.

18. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Use inches over miles: $\frac{2}{30} = \frac{5}{x}$. Cross-multiply: $2x = 150$, so $x = 75$ miles. So the final answer is 75 miles.

Keep Building CBEST Math Skills

Recommended Effortless Math resources



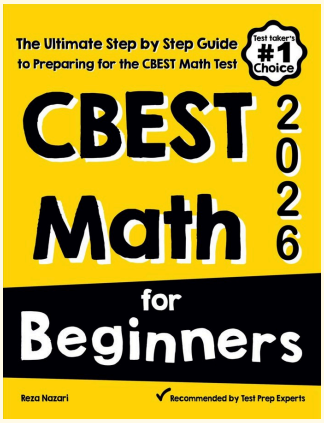
CBEST Math Test Prep Bundle

Use the complete CBEST Math resource for review, worked examples, extra practice, and test-style questions after each worksheet.

Scan Me

Download Instantly

STUDENT FAVORITE - CBEST Math for Beginners



CBEST Math for Beginners 2026

Step-by-step lessons, topic practice, and full review support for students who want a calm path through CBEST Math preparation.

A strong companion for self-study, tutoring, homework, and targeted review.

PDF Edition

Scan Me

Download Instantly

For more CBEST Math prep, visit EffortlessMath.com/CBEST