

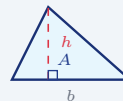
# Literal Equations and Formulas

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Score: \_\_\_\_\_ / 18

## Quick Review and Helpful Hints

A *literal equation* contains more than one variable (often a formula). To solve for one variable, isolate it with inverse operations, treating the other letters as if they were numbers. The result lets you plug in values any time.

▶ **Example:** Solve  $A = \frac{1}{2}bh$  for  $h$ . **Work:** Multiply both sides by 2:  
 $2A = bh$ . Divide both sides by  $b$ :  $h = \frac{2A}{b}$ . ★ **Answer:**  $h = \frac{2A}{b}$



$A = \frac{1}{2}bh$ , so  $h = \frac{2A}{b}$ .

### Practice Problems

Solve each for the indicated variable.

- |                          |       |                                |       |
|--------------------------|-------|--------------------------------|-------|
| 1. $d = rt$ for $r$      | _____ | 8. $A = \frac{1}{2}bh$ for $b$ | _____ |
| 2. $A = lw$ for $w$      | _____ | 9. $V = lwh$ for $h$           | _____ |
| 3. $P = 4s$ for $s$      | _____ | 10. $F = ma$ for $a$           | _____ |
| 4. $C = 2\pi r$ for $r$  | _____ | 11. $I = Prt$ for $t$          | _____ |
| 5. $y = mx + b$ for $b$  | _____ | 12. $2x + y = 10$ for $y$      | _____ |
| 6. $y = mx + b$ for $m$  | _____ | 13. $ax = b$ for $x$           | _____ |
| 7. $P = 2l + 2w$ for $l$ | _____ | 14. $\frac{x}{c} = d$ for $x$  | _____ |

### Word Problems

15. The area of a rectangle is  $A = lw$ . Solve for  $l$ , then find  $l$  when  $A = 24$  and  $w = 4$ . \_\_\_\_\_
16. Distance is  $d = rt$ . Solve for  $t$ , then find  $t$  when  $d = 120$  and  $r = 40$ . \_\_\_\_\_
17. Perimeter is  $P = 2l + 2w$ . Solve for  $w$ , then find  $w$  when  $P = 20$  and  $l = 6$ . \_\_\_\_\_
18. Simple interest is  $I = Prt$ . Solve for  $r$ , then find  $r$  when  $I = 60$ ,  $P = 500$ ,  $t = 2$ . \_\_\_\_\_



## Answer Keys

1.  $r = \frac{d}{t}$

2.  $w = \frac{A}{l}$

3.  $s = \frac{P}{4}$

4.  $r = \frac{C}{2\pi}$

5.  $b = y - mx$

6.  $m = \frac{y - b}{x}$

7.  $l = \frac{P - 2w}{2}$

8.  $b = \frac{2A}{h}$

9.  $h = \frac{V}{lw}$

10.  $a = \frac{F}{m}$

11.  $t = \frac{I}{Pr}$

12.  $y = 10 - 2x$

13.  $x = \frac{b}{a}$

14.  $x = cd$

15.  $l = \frac{A}{w} = 6$

16.  $t = \frac{d}{r} = 3$

17.  $w = \frac{P - 2l}{2} = 4$

18.  $r = \frac{I}{Pt} = 0.06$

### 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 Divide both sides by  $t$ :  $r = \frac{d}{t}$ . So the final answer is  $r = \frac{d}{t}$ .

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 Divide both sides by  $l$ :  $w = \frac{A}{l}$ . So the final answer is  $w = \frac{A}{l}$ .

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 Divide both sides by 4:  $s = \frac{P}{4}$ . So the final answer is  $s = \frac{P}{4}$ .

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 Divide both sides by  $2\pi$ :  $r = \frac{C}{2\pi}$ . So the final answer is  $r = \frac{C}{2\pi}$ .

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 Subtract  $mx$  from both sides:  $b = y - mx$ . So the final answer is  $b = y - mx$ .

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 Subtract  $b$ :  $y - b = mx$ . Divide by  $x$ :  $m = \frac{y - b}{x}$ . So the final answer is  $m = \frac{y - b}{x}$ .

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 Subtract  $2w$ :  $P - 2w = 2l$ . Divide by 2:  $l = \frac{P - 2w}{2}$ . So the final answer is  $l = \frac{P - 2w}{2}$ .

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 Multiply by 2:  $2A = bh$ . Divide by  $h$ :  $b = \frac{2A}{h}$ . So the final answer is  $b = \frac{2A}{h}$ .

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 Divide both sides by  $lw$ :  $h = \frac{V}{lw}$ . So the final answer is  $h = \frac{V}{lw}$ .

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 Divide both sides by  $m$ :  $a = \frac{F}{m}$ . So the final answer is  $a = \frac{F}{m}$ .

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 Divide both sides by  $Pr$ :  $t = \frac{I}{Pr}$ . So the final answer is  $t = \frac{I}{Pr}$ .

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 Subtract  $2x$  from both sides:  $y = 10 - 2x$ . So the final answer is  $y = 10 - 2x$ .

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 Divide both sides by  $a$ :  $x = \frac{b}{a}$ . So the final answer is  $x = \frac{b}{a}$ .

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 Multiply both sides by  $c$ :  $x = cd$ . So the final answer is  $x = cd$ .

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  $l = \frac{A}{w} = \frac{24}{4} = 6$ . So the final answer is  $l = \frac{A}{w} = 6$ .

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  $t = \frac{d}{r} = \frac{120}{40} = 3$ . So the final answer is  $t = \frac{d}{r} = 3$ .

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  $w = \frac{P - 2l}{2} = \frac{20 - 12}{2} = 4$ . So the final answer is  $w = \frac{P - 2l}{2} = 4$ .

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  $r = \frac{I}{Pt} = \frac{60}{1000} = 0.06$ . So the final answer is  $r = \frac{I}{Pt} = 0.06$ .



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