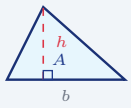
Literal Equations and Formulas

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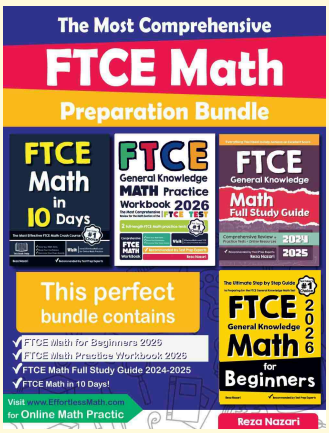

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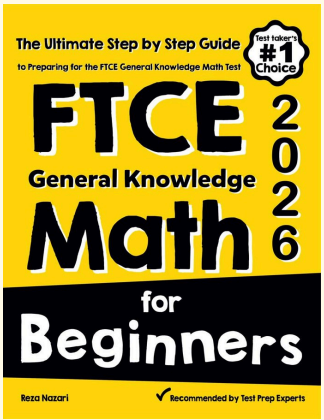

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