

# Literal Equations and Formulas

## Algebra 1 • Section 2.5

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Score: \_\_\_\_\_ / 12

### Quick Review and Helpful Hints

Solving means undoing operations in a sensible order while keeping both sides balanced. Show one clean move at a time, and substitute the answer back when the equation is easy to check.

▷ **Example:** Solve  $4x - 9 = 23$ .

**Work:** Add 9 to both sides:  $4x = 32$ . Divide by 4, so  $x = 8$ .

★ **Answer:**  $x = 8$

### ◆ Practice Problems

Solve each problem. Show enough work that another student could follow your thinking.

1. Solve  $y = mx + b$  for  $b$ .

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2. Solve  $A = \frac{1}{2}bh$  for  $h$ .

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3. Solve  $P = 2l + 2w$  for  $l$ .

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4. Solve  $C = 2\pi r$  for  $r$ .

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5. Solve  $d = rt$  for  $t$ .

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6. Solve  $F = \frac{9}{5}C + 32$  for  $C$ .

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7. Solve  $V = lwh$  for  $w$ .

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8. Solve  $I = Prt$  for  $r$ .

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9. Solve  $s = \frac{a+b+c}{2}$  for  $c$ .

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10. Solve  $q = 3p - 7$  for  $p$ .

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### ◆ Word Problems

11. The formula  $A = lw$  gives area. Solve for  $w$  and find  $w$  if  $A = 96$  and  $l = 12$ .

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12. The formula  $d = rt$  gives distance. Solve for  $r$  and find  $r$  if  $d = 180$  and  $t = 3$ .

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## Answer Keys

1.  $b = y - mx$

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

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

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

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

6.  $C = \frac{5}{9}(F - 32)$

7.  $w = \frac{V}{lh}$

8.  $r = \frac{I}{Pt}$

9.  $c = 2s - a - b$

10.  $p = \frac{q+7}{3}$

11.  $w = \frac{A}{l}; w = 8$

12.  $r = \frac{d}{t}; r = 60$

### Step-by-Step Explanations

1. Treat  $b$  like the unknown: it has  $mx$  added on, so subtract  $mx$  from both sides.
2. Clear the fraction by multiplying by 2, then divide by  $b$  — the letter still standing next to  $h$ .
3. First subtract the  $2w$  that's tagging along, then divide everything left by 2 to free  $l$ .
4. The whole chunk  $2\pi$  is multiplying  $r$ , so divide both sides by it as one unit.
5. Since rate and time are multiplied, dividing both sides by  $r$  leaves time on its own.
6. Undo it in reverse order: subtract 32 first, then multiply by  $\frac{5}{9}$  to cancel the  $\frac{9}{5}$ .

7. Three letters multiply together; the two that aren't  $w$  are  $l$  and  $h$ , so divide by their product.
8. Everything except  $r$  — that's  $P$  and  $t$  — is multiplying it, so divide both sides by  $Pt$ .
9. Multiply by 2 to lift the fraction, then move  $a$  and  $b$  off to isolate  $c$ .
10. Work backward through the operations on  $p$ : add 7 to both sides, then divide by 3.
11. Divide by  $l$  to get the general rule  $w = A/l$ , then plug in:  $96 \div 12 = 8$ .
12. Dividing by  $t$  rearranges it to  $r = d/t$ ; substituting the numbers gives  $180 \div 3 = 60$ .



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