

Algebra I
Section 2.5 Notes
Literal Equations and Formulas

Name: Key

Key Definitions:

1. A literal equation is an equation that involves two or more variables.

2. A formula is an equation that states a relationship among quantities.

Important Formulas:

Perimeter of a rectangle - $2b + 2h$

Area of a rectangle - $b \cdot h$

Circumference of a circle - $2\pi r$

Area of a circle - πr^2

Area of a triangle - $\frac{1}{2} b \cdot h$

Practice Problems

Solve each equation for m . Then find the value of m for each value of n .

1. $m + 3n = 7; n = -2, \text{ } \cancel{0}, \text{ } \cancel{1}$

$$m = -3n + 7$$

$$m = -3(-2) + 7 \quad m = 13$$

2. $3m + 9n = 24; n = -1, \text{ } \cancel{0}, \text{ } \cancel{2}$

$$3m = -9n + 24$$

$$m = -3n + 8$$

$$m = -3(-1) + 8 \quad m = 11$$

3. $-2n = 4m + 8; n = -1, \text{ } \cancel{0}, \text{ } \cancel{2}$

$$-2n - 8 = 4m$$

$$-\frac{1}{4}(-2n - 8) = m$$

$$m = -\frac{1}{4}(-2) - 2$$

$$m = -\frac{3}{2}$$

4. $2m = -6n - 10; n = 1, \text{ } \cancel{0}, \text{ } \cancel{2}$

$$2m = -6n - 10$$

$$m = -3n - 5$$

$$m = -3(1) - 5$$

$$m = -8$$

5. $8n = -3m + 1; n = -2, \text{ } \cancel{0}, \text{ } \cancel{1}$

$$8n - 1 = -3m$$

$$\frac{8n - 1}{-3} = m$$

$$m = \frac{8(-2) - 1}{-3}$$

$$m = -\frac{17}{3}$$

6. $4n - 6m = -2; n = -2, \text{ } \cancel{0}, \text{ } \cancel{1}$

$$-6m = -2 - 4n$$

$$m = -\frac{2}{6} - \frac{4(-2)}{6}$$

$$m = \frac{6}{6} = 1$$

7. $-5n = 13 - 3m; n = -3, \text{ } \cancel{0}, \text{ } \cancel{1}$

$$-5n - 13 = -3m$$

$$\frac{-5n - 13}{-3} = m$$

$$m = \frac{5(-3) - 13}{-3}$$

$$m = -\frac{2}{3}$$

8. $10m + 6n = 12; n = -2, \text{ } \cancel{0}, \text{ } \cancel{1}$

$$10m = 12 - 6n$$

$$m = \frac{12}{10} - \frac{6n}{10}$$

$$m = \frac{12}{10} - \frac{6(-2)}{10}$$

$$m = \frac{24}{10} = \frac{12}{5}$$

Solve each equation for x.

9. $fx - gx = h$

$$\frac{(f-g)x = h}{(f-g)(f-g)}$$

$$x = \frac{h}{f-g}$$

12. $d = f + fx$

$$d - f = f + fx - f$$

$$\frac{d-f}{f} = \frac{fx}{f}$$

$$\frac{d-f}{f} - 1 = x$$

10. $qx + x = r$

$$\frac{(q+1)x = r}{(q+1)(q+1)}$$

$$x = \frac{r}{q+1}$$

13. $-3(x+n) = x$

$$-3x - 3n = x$$

$$+3x \quad +3x$$

$$-3n = \frac{4x}{4} \quad \left(\frac{-3n}{4} = x \right)$$

11. $m = \frac{x+n}{p} \cdot p$

$$mp = x+n$$

$$-n \quad -n$$

$$mp - n = x$$

14. $\frac{x-4}{y+2} = 5 \cdot y+a$

$$x-4 = 5(y+a)$$

$$+4 \quad +4$$

$$x = 5(y+a) + 4$$

Solve each equation for the given variable.

22. $4k + mn = n - 3; n$

$$4k + mn + 3 = n$$

$$-mn \quad -mn$$

$$4k + 3 = n - mn$$

$$4k + 3 = \frac{(1-m)n}{(1-m)}$$

$$n = \frac{4k+3}{(1-m)}$$

23. $\frac{c}{d} + 2 = \frac{f}{g}; c$

$$d \cdot \frac{c}{d} = \frac{f}{g} - 2 \cdot d$$

$$c = \left(\frac{f}{g} - 2 \right) \cdot d$$

24. $3ab - 2bc = 12; c$

$$-3ab \quad -3ab$$

$$-abc = 12 - 3ab$$

$$-ab \quad -ab$$

$$c = \frac{12}{-ab} - \frac{3ab}{-ab}$$

$$c = -\frac{12}{ab} + \frac{3a}{b}$$

25. $z = \left(\frac{x+y}{3} \right) w; y$

26. $-3(m-2n) = 5m; m$

27. $A = \frac{1}{2}bcd + bc; d$

Solve each problem. Round to the nearest tenth, if necessary. Use 3.14 for pi.

28. What is the width of a rectangle with length 14 cm and area 161 cm²?




$$A = l \cdot w$$

$$\frac{161}{14} = \frac{14w}{14}$$

$$W = 11.5$$

29. What is the radius of a circle with circumference 13 ft?



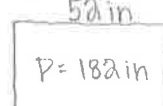
$$C = 2\pi r$$

$$13 = 2(3.14)r$$

$$\frac{13}{6.28} = \frac{6.28r}{6.28}$$

$$r = 2.07$$

30. A rectangle has perimeter 182 in. and length 52 in. What is the width?



$$P = 2l + 2w$$

$$182 = 2(52) + 2w$$

$$182 = 104 + 2w$$

$$-104 \quad -104$$

$$\frac{78}{2} = \frac{2w}{2}$$

$$W = 39$$