

Algebra 1

Solve multi-step equations.

Solve an equation by combining like terms

1. $9x + x - 7 = 13$ $9 \cdot 2 + 2 - 7 = 13$
 $10x - 7 = 13$ $18 + 2 - 7 = 13 \checkmark$
 $10x = 20$ $x = 2$

2. $8x - 3x - 10 = 20$ $8 \cdot 6 - 3 \cdot 6 - 10 = 20$
 $5x - 10 = 20$ $48 - 18 - 10 = 20$
 $5x = 30$ $x = 6$

Solve an equation using the distributive property

3. $7x + 2(x+6) = 39$ $7 \cdot 3 + 2(3+6) = 39$
 $7x + 2x + 12 = 39$ $21 + 18 = 39 \checkmark$
 $9x + 12 = 39$
 $9x = 27$
 $x = 3$

4. $4x - 7(x-2) = 26$ $4 \cdot 4 - 7(-4-2)$
 $4x - 7x + 14 = 26$ $-16 + 42$
 $-3x + 14 = 26$ $34 - 16$
 $-3x = 12$ 28
 $x = -4$

Multiply by a reciprocal to solve an equation

Remember $\frac{2}{3} \cdot \frac{3}{2} x = -2 \cdot \frac{2}{3}$
 $x = -\frac{4}{3}$

Try this: Solve the equations.

1. $9d - 2d + 4 = 32$
 $7d + 4 = 32$
 $7d = 28$
 $d = 4$

3. $6x - 2(x-5) = 46$
 $6x - 2x + 10 = 46$
 $4x + 10 = 46$
 $4x = 36$
 $x = 9$

5. $\frac{2}{3} \cdot \frac{3}{2} (3x+5) = -24 \cdot \frac{2}{3}$
 $3x+5 = -16$
 $3x = -21$ $x = -7$

6. $\frac{2}{3} \cdot \frac{3}{2} (2x-4) = 18 \cdot \frac{5}{3}$
 $2x-4 = 30$
 $2x = 34$
 $x = 17$

Try this:

$$4\frac{3}{4}(z - 6) = 12 \cdot \frac{4}{3}$$

$$z - 6 = 16$$

$$\begin{array}{r} +6 \\ +6 \end{array}$$

$$\boxed{z = 22}$$

$$6\frac{-5}{4} - \frac{4}{5}(4a - 1) = 28 \cdot \frac{-5}{4}$$

$$4a - 1 = -35$$

$$\begin{array}{r} +1 \\ +1 \end{array}$$

$$\frac{4a}{4} = \frac{-34}{4}$$

$$\boxed{a = \frac{-17}{2}} \approx -8.5$$

EXAMPLE 5 Write and solve an equation

BIRD MIGRATION A flock of cranes migrates from Canada to Texas. The cranes take 14 days (336 hours) to travel 2500 miles. The cranes fly at an average speed of 25 miles per hour. How many hours of the migration are the cranes not flying?



Distance (miles)	=	Rate (miles/hour)	·	Time spent flying (hours)
2500	=	25	·	X
25		25		

100 = X 100 hrs flying

336 - 100 = $\boxed{236 \text{ hrs not flying}}$

D = R · T

Edmund and Roberto took a 7-day (168 hours), 90-mile canoe trip down the Allagash River. If they paddled at an average rate of 2.5 miles per hour, how many hours did they spend not paddling? Write and solve an equation to find the answer.

D = R · T

$$\frac{90}{2.5} = \frac{2.5 \cdot X}{2.5}$$

$$36 = X$$

$$168 - 36 = \boxed{132 \text{ hrs spent NOT paddling}}$$

Ⓐ Aaron and Alice are bowling. Alice's score is twice the difference of Aaron's score and 5. The sum of their scores is 320. Find each student's bowling score.

let x = Aaron's score

$$2(x - 5) + x = 320$$

Alice's score

Aaron's score = $\boxed{110}$
 Alice's score = $2(110 - 5)$
 $2(105)$
 $\boxed{210}$

$$2x - 10 + x = 320$$

$$3x - 10 = 320$$

$$\begin{array}{r} +10 \\ +10 \end{array}$$

$$\frac{3x}{3} = \frac{330}{3}$$

$$x = 110$$

- Ⓑ Mari, Carlos, and Amanda collect stamps. Carlos has $\overset{5}{5}$ more stamps $\overset{+}{+}$ than $\overset{m}{m}$ Mari, and Amanda has three times as many stamps as Carlos. Altogether, they have 100 stamps. Find the number of stamps each person has.

let $M =$ Mari's # of stamps

let Carlos = $5 + m$

let Amanda = $3(5+m)$

Mari + Carlos + Amanda
 $M + 5+m + 3(5+m) = 100$

$$\underline{m} + \underline{5} + \underline{m} + \underline{15} + \underline{3m} = 100$$

$$5m + 20 = 100$$

$$\quad \quad \quad -20 \quad -20$$

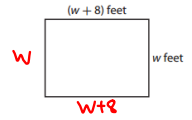
$$\frac{5m}{5} = \frac{80}{5} \quad m = 16$$

Mari has 16 stamps, Carlos has 21 stamps, Amanda has 63 stamps

Try this:

Write and solve an equation to solve the problem.

5. A rectangular garden is fenced on all sides with 256 feet of fencing. The garden is 8 feet longer than it is wide. Find the length and width of the garden.



$$w + w + 8 + w + w + 8 = 256$$

$$2w + 2(w+8) = 256$$

$$4w + 16 = 256$$

$$w = 60$$

Width = 60 ft
 Length = 68 ft

Homework:

3.3 B WS