Algebra 1 Notes

P2 1-2 Solving Multi-Step Equations

Aug 15-9:29 AM

3 + + 8

Warm Up

Simplify the expression.

1. $(2x^2 + 6x) + (-2x^2 + 3x)$

$2x^2 + 6x + 2x^2 + 3x$

$4x^2 + 9x$

2. $(5a^2 - a) - (2a^2 - 5a)$

3. $(4y^2 + y) - (6y^2 - 5y)$

4. $(-2d^2 - d) - (5d^2 - 5d)$

5. $(2h^2 + 5z) + (2h^2 + 9z)$

6. $(2y^2 + 9xy) + (3y^2 - 2xy)$

Warm Up

Warm Up

PEMDAS

Determine whether the given number is a solution to the equation.

1. $6x + 1 = 7x - 1;\ x = 2$

Yes

$6 \cdot 2 + 1 = 7 \cdot 2 - 1$

$12 + 1 = 14 - 1$

$13 = 13$ ✓

2. $5 - 4x = 2x^2 + x;\ x = 3$

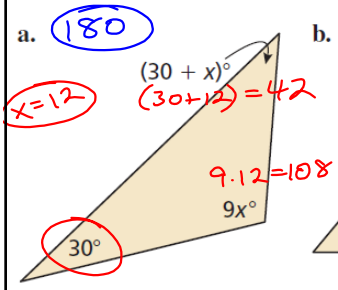
3. $2y - \frac{2}{3} = 2;\ y = \frac{4}{3}$

4. $\frac{4u}{3} = -8;\ u = -6$

Cumulative Warm Up

The sum S of the angle measures of a polygon with n sides can be found using the formula $S = 180(n - 2)$. Write and solve an equation to find each value of x. Justify the steps in your solution. Then find the angle measures of each polygon. How can you check the reasonableness of your answers?

a. 180

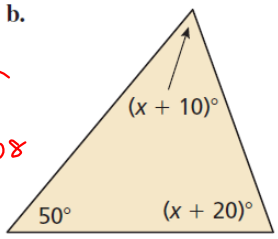


x=12

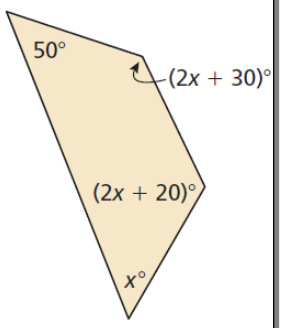
(30+12)=42

9·12=108

b.



c.



$9x + 30 + (30 + x) = 180$

$9x + 30 + 30 + x = 180$

$10x + 60 = 180$

$-60 \quad -60$

$\frac{10x}{10} = \frac{120}{10}$

$x = 12$

Exploration 1a-c

Core Concept

Solving Multi-Step Equations

To solve a multi-step equation, simplify each side of the equation, if necessary. Then use inverse operations to isolate the variable.

6 Steps for Solving Equations

Simplify

1. Change Minus to Plus the Opposite
2. Distribute if you can
3. Combine like terms

Solve

4. Get Variable on one side and Constant on the other
5. Undo Addition and Subtraction
6. Undo Multiplication and Division

Core Concept

Solve

$2.5x - 13 = 2$

$+13 \quad +13$

$\frac{2.5x}{2.5} = \frac{15}{2.5}$

$x = 6$

Check

$2.5(6) - 13 = 2$

$15 - 13 = 2$

$2 = 2$ ✓

$-2n + 3 = 9$

$-3 \quad -3$

$\frac{-2n}{-2} = \frac{6}{-2}$

$n = -3$

Example 1

Solve each equation.

$-2x + 10x + 12 = 18$

$-12x + 12 = 18$

$-12 \quad -12$

$\frac{-12x}{-12} = \frac{6}{-12}$

$x = \frac{6}{-12}$ $\quad \frac{1}{-2} = \frac{-1}{2} = -\frac{1}{2} = -.5$

$-21 = \frac{1}{2}c + 11$

$+11 \quad +11$

$-10 = \frac{1}{2}c$

$\frac{-10}{.5} = \frac{.5c}{.5}$

$-20 = c$

Monitoring Progress 1-3

Solve

$2(1 + x) + 3 = -8$

$2 + 2x + 3 = -8$

$5 + 2x = -8$

$-5 \quad -5$

$\frac{2x}{2} = \frac{-13}{2}$

$x = 6.5$

$-12 = 9x - 6x + 15$

Example 2

Solve each equation. Check your solution.

$3(x + 1) + 6 = -9$

$3x + 3 + 6 = -9$

$3x + 9 = -9$

$-9 \quad -9$

$\frac{3x}{3} = \frac{-18}{3}$

$x = -6$

$15 = 5 + 4(2d - 3)$

$15 = 5 + 8d - 12$

$15 = -7 + 8d$

$+7 \quad +7$

$\frac{22}{8} = \frac{8d}{8}$

$2.75 = d$

$13 = -2(y - 4) + 3y$

$13 = -2y + 8 + 3y$

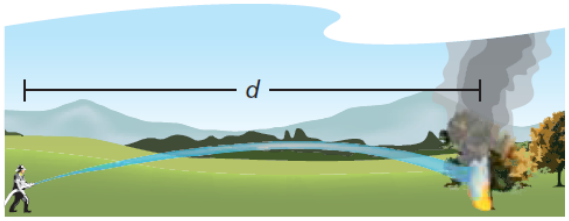
$2x(5 - 3) - 3x = 5$

$-4(2m + 5) - 3m = 35$

$5(3 - x) + 2(3 - x) = 14$

Monitoring Progress 4-9

The formula $d = \frac{1}{2}n + 26$ relates the nozzle pressure n (in pounds per square inch) of a fire hose and the maximum horizontal distance the water reaches d (in feet). How much pressure is needed to reach a fire 50 feet away?

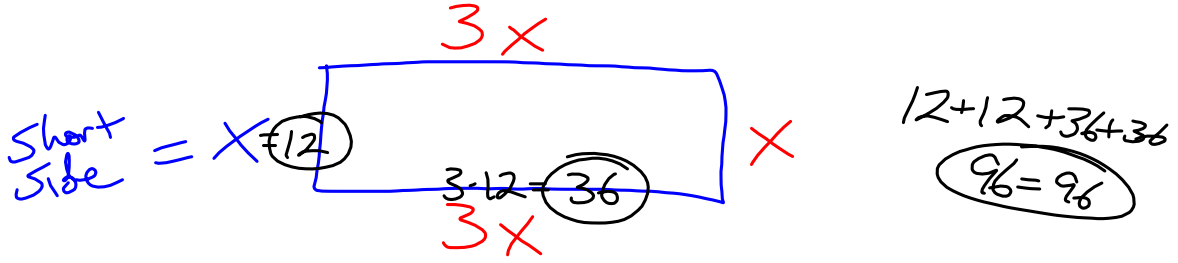


$50 = \frac{1}{2}n + 26$

Monitoring Progress 10

You have 96 feet of fencing to enclose a rectangular pen for your dog. To provide sufficient running space for your dog to exercise, the pen should be three times as long as it is wide.

Find the dimensions of the pen.



$$x + x + 3x + 3x = 96$$

$$\frac{8x}{8} = \frac{96}{8}$$

$$x = 12$$

Monitoring Progress 11

HW #2
Day 1...1-2 P16 #3-25 Odds

HW #2A
Day 2...1-2 P16 #4-26 Evens

Please put your name and class period at the top of the homework.
Also include the homework number.

Aug 15-9:33 AM

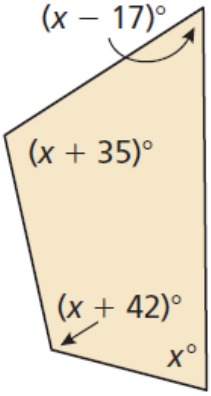
Solve each equation.

$2x(5 - 3) - 3x = 5$ $-4(2m + 5) - 3m = 35$ $5(3 - x) + 2(3 - x) = 14$

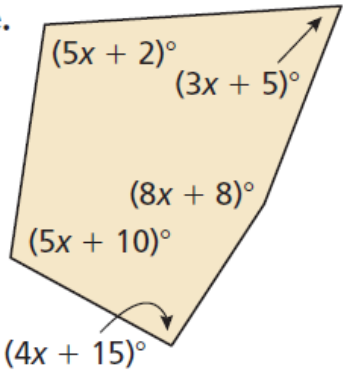
Monitoring Progress 4-9

The sum S of the angle measures of a polygon with n sides can be found using the formula $S = 180(n - 2)$. Write and solve an equation to find each value of x. Justify the steps in your solution. Then find the angle measures of each polygon. How can you check the reasonableness of your answers?

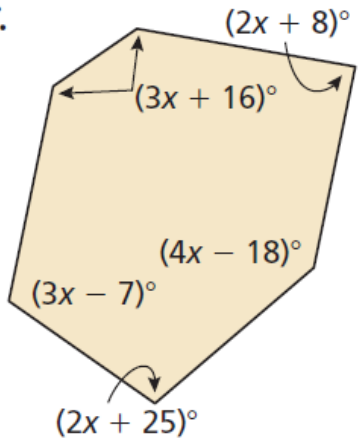
d.



e.



f.



Exploration 1d-f

Use the table to find the number of miles x you need to bike on Friday so that the mean number of miles biked per day is 5.

Day	Miles
Monday	3.5
Tuesday	5.5
Wednesday	0
Thursday	5
Friday	x

Example 4

Your school's drama club charges $4 per person for admission to a play. The club borrowed $400 to pay for costumes and props. After paying back the loan, the club has a profit of $100. How many people attended the play?

Example 5