

USING EQUATIONS to solve WORD PROBLEMS

Directions: Set up and solve an equation for each problem below.

1. The product of 7 and a number, increased by 3, is equal to twice the number, subtracted from 39. Find the number.

let $x = \text{number}$

$$7x + 3 = 39 - 2x$$

$$9x + 3 = 39$$

$$9x = 36$$

$$x = 4$$

2. Five less than twice a number is equal to one half the difference of three times the number and 13. Find the number.

let $x = \text{number}$

$$2x - 5 = \frac{1}{2}(3x - 13)$$

$$2x - 5 = \frac{3}{2}x - \frac{13}{2}$$

$$\frac{1}{2}x - 5 = -\frac{13}{2}$$

$$\frac{1}{2}x = -\frac{3}{2}$$

$$x = -3$$

3. One number is 9 more than twice another number. If the sum of the numbers is 129, find both numbers.

let $x = \text{number}$

let $2x + 9 = \text{other number}$

$$(x) + (2x + 9) = 129$$

$$3x + 9 = 129$$

$$3x = 120$$

$$x = 40$$

$$40, 89$$

4. Kara's golf score was 1 less than three fourths of Greg's golf score. If the sum of their scores was 153, find Kara's golf score.

let $x = \text{Greg's score}$

let $\frac{3}{4}x - 1 = \text{Kara's score}$

$$(x) + (\frac{3}{4}x - 1) = 153$$

$$\frac{7}{4}x - 1 = 153$$

$$7x - 4 = 612$$

$$7x = 616$$

$$x = 88$$

$$\text{Kara} = 65$$

5. The length of a rectangle is one more than four times its width. If the perimeter of the rectangle is 62 meters, find the dimensions of the rectangle.

let $x = \text{width}$

let $4x + 1 = \text{length}$

$$2(x) + 2(4x + 1) = 62$$

$$2x + 8x + 2 = 62$$

$$10x + 2 = 62$$

$$10x = 60$$

$$x = 6$$

$$\text{width} = 6$$

$$\text{length} = 25$$

6. The length of one base of a trapezoid is 19 less than five times the length of the other base. If the trapezoid has a height of 18 feet and an area of 477 ft², find the length of the longer base.

let $x = \text{base 1}$

let $5x + 19 = \text{base 2}$

$$477 = \frac{1}{2}(x + 5x + 19) \cdot 18$$

$$477 = 9(x + 19)$$

$$53 = 6x + 19$$

$$72 = 6x$$

$$12 = x$$

$$\text{longer base} = 41$$

7. The measure of one angle is six more than half the measure of another angle. If the angles are complementary, find both measures.

let $x = \text{angle 1}$

let $\frac{1}{2}x + 6 = \text{angle 2}$

$$x + \frac{1}{2}x + 6 = 90$$

$$\frac{3}{2}x + 6 = 90$$

$$3x + 12 = 180$$

$$3x = 168$$

$$x = 56$$

56, 34

8. Kelly, Laura, and Tia sold boxes of cookies for a fundraiser. Kelly sold 15 boxes less than Laura. Tia sold twice as many boxes as Kelly. If they sold 83 boxes of cookies in total, how many boxes did each girl sell?

let $x = \text{Laura's sales}$

let $x - 15 = \text{Kelly's sales}$

let $2x - 30 = \text{Tia's sales}$

$$x + x - 15 + 2x - 30 = 83$$

$$4x - 45 = 83$$

$$4x = 128$$

$$x = 32$$

Laura = 32
Kelly = 17
Tia = 34

9. The measure of the vertex angle in an isosceles triangle is six less than four times the measure of a base angle. Find the measure of the vertex angle.

let $x = \text{base angle}$

let $4x - 6 = \text{vertex angle}$

$$4x - 6 + 2(x) = 180$$

$$4x - 6 + 2x = 180$$

$$6x - 6 = 180$$

$$6x = 186$$

$$x = 31$$

Vertex
Angle = 118

10. The sum of four consecutive integers is 222. Find the integers.

let $x = 1^{\text{st}}$ integer

let $x + 1 = 2^{\text{nd}}$ integer

let $x + 2 = 3^{\text{rd}}$ integer

let $x + 3 = 4^{\text{th}}$ integer

$$x + x + 1 + x + 2 + x + 3 = 222$$

$$4x + 6 = 222$$

$$4x = 216$$

$$x = 54$$

54, 55, 56, 57

11. The sum of three consecutive odd integers is 93. Find the integers.

let $x = 1^{\text{st}}$ odd integer

let $x + 2 = 2^{\text{nd}}$ odd integer

let $x + 4 = 3^{\text{rd}}$ odd integer

$$x + x + 2 + x + 4 = 93$$

$$3x + 6 = 93$$

$$3x = 87$$

$$x = 29$$

29, 31, 33

12. Find three consecutive even integers such that the sum of the smallest and twice the second is 20 more than the third.

let $x = 1^{\text{st}}$ even integer

let $x + 2 = 2^{\text{nd}}$ even integer

let $x + 4 = 3^{\text{rd}}$ even integer

$$x + 2(x + 2) = x + 4 + 20$$

$$x + 2x + 4 = x + 24$$

$$3x + 4 = x + 24$$

$$2x + 4 = 24$$

$$2x = 20$$

$$x = 10$$

10, 12, 14