

Unit 6

Algebraic Representations & Applications

Solving Equations

- Variable
- Letter that represents a number
- Object
- Isolate the variable
- How To
1. Draw a Line down the = sign
(anything you do on one side of the line you must do on the other also)
 2. Remove items that are on the same side of the equation as the variable.
(Perform the **opposite operation** from the problem starting with non-attached items.)

Solving Equations

Example

$$\begin{array}{r|l}
 3y + 2 = 14 & \\
 \hline
 -2 & -2 \\
 \hline
 3y & 12 \\
 \hline
 3 & 3 \\
 \hline
 y & 4
 \end{array}$$

Check

$$\begin{aligned}
 3y + 2 &= 14 \\
 3(4) + 2 &= 14 \\
 12 + 2 &= 14 \\
 14 &= 14
 \end{aligned}$$

Solving Equations

Example

$$\begin{array}{r|l}
 3n + 4 = 10 & \\
 \hline
 -4 & -4 \\
 \hline
 3n & 6 \\
 \hline
 3 & 3 \\
 \hline
 n & 2
 \end{array}$$

Check

$$\begin{aligned}
 3n + 4 &= 10 \\
 3(2) + 4 &= 10 \\
 6 + 4 &= 10 \\
 10 &= 10
 \end{aligned}$$

Solving Equations

Example

$$\begin{array}{r|l}
 9y - 15 = 21 & \\
 +15 & +15 \\
 \hline
 9y & 36 \\
 \hline
 y & 4
 \end{array}$$

Check $9y - 15 = 21$
 $9(4) - 15 = 21$
 $36 - 15 = 21$
 $21 = 21$

Circles

Circle

- Distance around a circle = 360°

Circumference

- $2\pi r$ - if given radius
- πd - if given diameter
- r = radius
- d = diameter

Area

- πr^2 - square the radius then multiply by pi

Circles

Example

- A swimming pool has a diameter of 12ft. What is the circumference of the swimming pool?

$$\begin{aligned}
 C &= \pi d \\
 &= 3.14(12) \\
 C &= 37.68 \text{ ft}
 \end{aligned}$$

Circles

Example

- A tire has a radius of 8 inches. What is the circumference of the tire?

$$\begin{aligned}
 C &= 2\pi r \\
 &= 2(3.14)(8) \\
 &= 50.24 \text{ in}
 \end{aligned}$$

$$C = 50.24 \text{ in}$$

Circles

Example A swimming pool has a radius of 5 ft. What is the area of the pool?

$$A = \pi r^2$$

$$3.14(5^2)$$

$$3.14(25)$$

$$A = 78.5 \text{ ft}^2$$

Volume

Definition • The amount of space inside a 3-d figure. The capacity it will hold.

Volume of Cylinder • $V = Bh$ - big B means find the area of the base. The formula translates to $v = \pi r^2 h$

Volume

Example • A water tank is 14 feet tall. Its base has a diameter of 6 feet. How much water can the tank hold?

$$V = Bh$$

$$= \pi r^2 h$$

$$= 3.14(3^2)(14)$$

$$= 3.14(9)(14)$$

$$= 28.26(14)$$

$$V = 395.64 \text{ ft}^3$$

Volume

Example A glass beaker measures 4 in across. The beaker is 10 inches tall. About how much water will it hold?

$$V = Bh$$

$$= \pi r^2 h$$

$$= 3.14(2^2)(10)$$

$$= 3.14(4)(10)$$

$$= 12.56(10)$$

$$V = 125.6 \text{ in}^3$$