

Sec. 1-9 Patterns, Equations, and Graphs

Vocabulary

- solution of an equation: values of the variables which make the equation true
 - * Note: (x, y) , ordered pairs are solutions to equations with two variables x and y .
- inductive reasoning: the process of reaching a conclusion based on an observed pattern

Problem 1: Is the given point a solution to the equation?

a. $y = 3x$; $(\overset{x}{5}, \overset{y}{15}) \rightarrow$ solution

$$15 = 3(5)$$

$$15 = 15$$

T

b. $y = 4x$; $(\overset{x}{5}, \overset{y}{20})$, $(\overset{x}{-5}, \overset{y}{20})$, $(\overset{x}{-20}, \overset{y}{-5})$

$$20 = 4(5)$$

$$20 = 20$$

T

$$20 = 4(-5)$$

$$20 = -20$$

F

$$-5 = 4(-20)$$

$$-5 = -80$$

F

Problem 2: You have 4 more left socks than right socks. How can you represent the relationship between the number of left and right socks in three different ways?

Define the variables: $x =$ the ^{independent} number of right socks
 $y =$ the ^{dependent} number of left socks

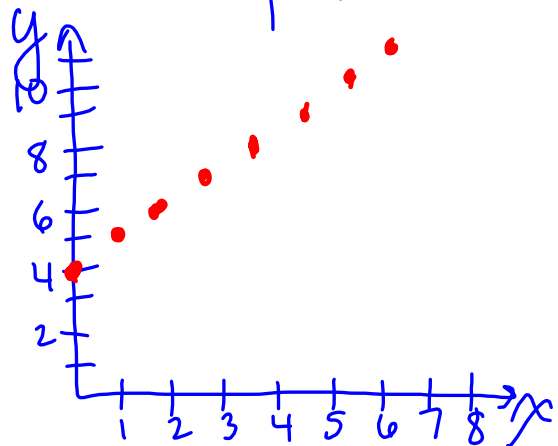
Table

x	y
4	8
5	9
6	10
7	11
8	12

Equation

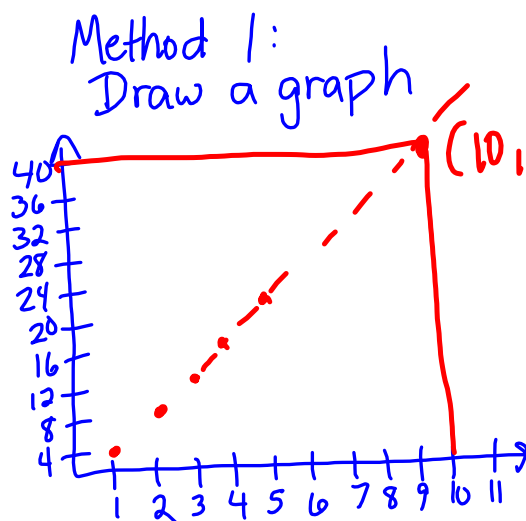
$$y = x + 4$$

Graph



Problem 3: The table shows the relationship between the number of chairs and the total number of legs. Extend the pattern. What is the total number of legs on 10 chairs?

x	y
1	4
2	8
3	12
4	16
5	20



Method 2:
Write an equation

$$y = 4x$$

Operations With Rational and Irrational Numbers

- Is the result a rational or irrational number?

$(\frac{a}{b})$ $(\pi \text{ or } \sqrt{\quad})$
Simp.

$$1. \underbrace{\frac{5}{5}}_R \cdot \underbrace{\frac{5}{8}}_R + \underbrace{\frac{3}{5}}_R \cdot \underbrace{\frac{8}{8}}_R = \frac{25}{40} + \frac{24}{40} = \frac{49}{40} \text{ rational}$$

$$2. \underbrace{-\frac{1}{4}}_R + \underbrace{\frac{2}{5}}_R = \text{rational}$$

$$\sqrt{25} = \boxed{\frac{5}{1}}_R$$

$$3. \underbrace{-\frac{1}{2}}_R + \underbrace{\sqrt{2}}_I = \text{irrational}$$

$$4. \underbrace{\sqrt{5}}_I + \underbrace{\left(-\frac{3}{11}\right)}_R = \text{irrational}$$

$$5. \underbrace{\sqrt{3}}_I + \underbrace{\sqrt{3}}_I = 2\sqrt{3} \text{ irrational}$$