

Warm Up

November 13, 2018

1.) Solve for x : $3x^2 + 7 = 56$

2.) Solve for h : $V = \frac{Bh}{3}$

3.) The length of a rectangle is 5 more than its width. If the rectangle has a perimeter of 86, what is the length of the rectangle?

Average Rate of Change -> SLOPE

$$\frac{\Delta y}{\Delta x}, \text{ or the } \frac{\text{change in } y}{\text{change in } x}$$

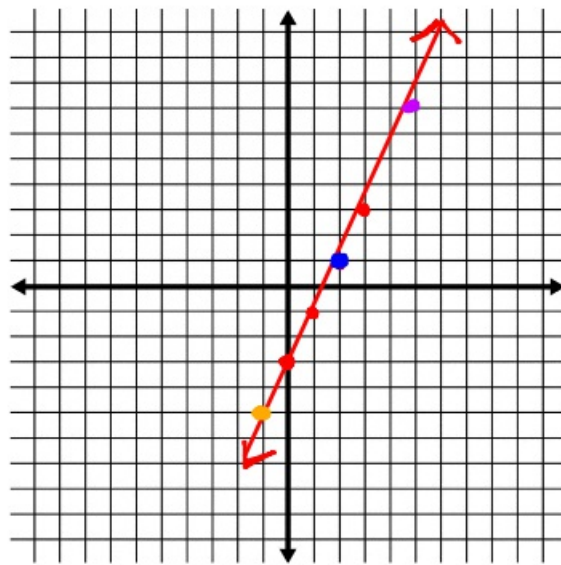
All linear equations have a **constant** rate of change on all intervals.

$$y = mx + b$$

Example: Use the equation $f(x) = 2x - 3$ to find the average rate of change over the intervals

A.) $2 \leq x \leq 5$
 $(2, 1)$ $(5, 7)$
 $m = \frac{7-1}{5-2} = \frac{6}{3}$
 $m = 2$

B.) $-1 \leq x \leq 3$
 $(-1, -5)$ $(3, 3)$
 $m = \frac{3 - (-5)}{3 - (-1)} = \frac{8}{4}$
 $m = 2$



From Tables

Use the table of values to find the average rate of change over the given interval

x	1	3.8	4.7	9	13.8	12
y	3	5.1	8.7	15.8	25.1	30.86

A.) [1, 9]
(1, 3) (9, 15.8)

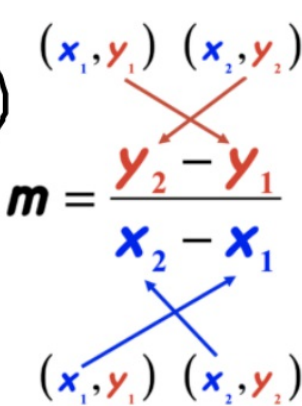
$$m = \frac{15.8 - 3}{9 - 1}$$
$$m = 1.6$$

B.) [9, 12]
(9, 15.8) (12, 30.86)

$$m = \frac{30.86 - 15.8}{12 - 9} = \frac{15.06}{3}$$
$$m = 5.02$$

C.) [3.8, 13.8]

D.) [4.7, 13.8]



Test Prep

The table below represents the average price of a movie ticket in the given year.

Year	1987	1991	1995	1999	2003	2007	2009
Price (\$)	3.91	4.21	4.35	5.06	6.03	6.88	7.50

To the nearest cent, what was the average rate of change of the ticket price between 1991 and 2009?

$$m = \frac{7.50 - 4.21}{2009 - 1991} = \frac{3.29}{18}$$
$$m = .18$$

On average, the movie ticket prices increased by \$0.18 per year from 1991 to 2009.

Test Prep

The table below shows the population of Texas since 1970.

Year	1970	1980	1990	2000	2010
Population (in millions)	11.2	14.2	17.0	20.9	25.1

A.) Find the average rate of change for each decade.

$$\frac{1970-1980}{m} = \frac{3}{10} = .3$$

$$\frac{1980-1990}{m} = \frac{2.8}{10} = .28$$

↓
10 years

$$\frac{1990-2000}{m} = \frac{3.9}{10} = .39$$

$$\frac{2000-2010}{m} = \frac{4.2}{10} = .42$$

B.) During which decade was the average rate of change the largest? 2000-2010

From Graphs

Compute the average rate of change from A to B, B to C, and A to C. Which interval has the smallest rate of change?

$$\frac{A \text{ to } B}{m = \frac{8-5}{4-2} = \frac{3}{2}}$$

$$\frac{B \text{ to } C}{m = \frac{10-8}{8-4} = \frac{2}{4} = \frac{1}{2}}$$

$$\frac{A \text{ to } C}{m = \frac{10-5}{8-2} = \frac{5}{6}}$$

