$\frac{f(b)-f(a)}{b-a}$ $\frac{\text{bottom}-\text{top}}{\text{bottom}-\text{top}}$

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Date _____
Algebra II

Average Rate of Change

1. The function $h(x)$ is given in the table below. Which of the following gives its average rate of change over the interval $2 \le x \le 6$?

$\frac{3-9}{6-2} = \frac{-3}{2}$

(1) $-\frac{3}{2}$

(2) $\frac{6}{4}$

(3) $-\frac{7}{6}$

(4) -1

x	$h(x)$
0	10
2	9
4	6
6	3

2. Jessica is planning to build a square playing field. She wants to see how long the sides of the field will need to be for different areas. Her results are summarized in the following table. All values are rounded to the *nearest hundredth* when necessary.
What is the average rate of change in the side length as the area increases from 200 square feet to 500 square feet?

$\frac{22.36-14.14}{500-200} = .0274$

Area (square feet)	Side Length (feet)
100	10
200	14.14
300	17.32
400	20
500	22.36
600	24.49
700	26.46
800	28.28
900	30

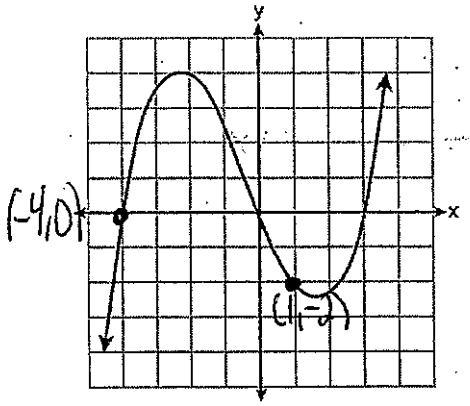
3. What is the average rate of change from 0 to 2?

$\frac{5-1}{2-0} = 2$

x	f(x)
0	1
1	2
2	5
3	7

Pull the y value from the graph

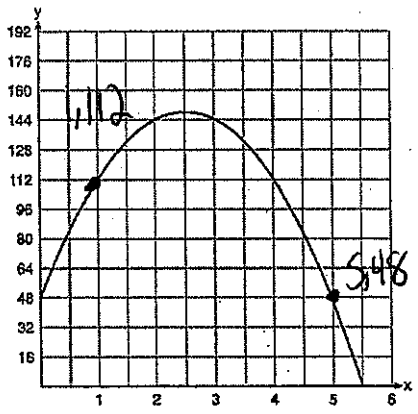
4. The graph of $p(x)$ is shown below. What is the average rate of change over the interval $-4 \le x \le 1$?



x	y
-4	0
1	-2

$$\frac{-2-0}{1-(-4)} \qquad \frac{-2}{5}$$

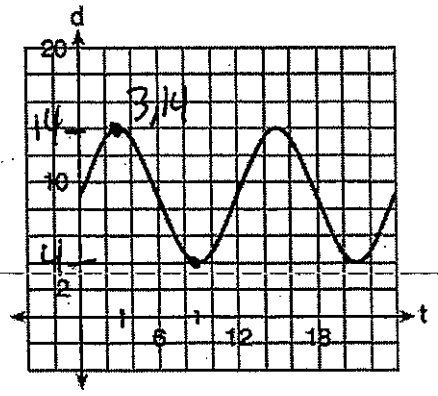
5. A ball is thrown into the air from the edge of a 48-foot-high cliff so that it eventually lands on the ground. The graph below shows the height, y, of the ball from the ground after x seconds. What is the average rate of change of the ball between 1 and 5 seconds?



x	y
1	112
5	48

$$\frac{48-112}{5-1} = -16$$

6. The depth of the water at a marker 20 feet from the shore in a bay is depicted in the graph below. If the depth, d, is measured in feet and time, t, is measured in hours since midnight, what is the average rate of change of the depth of the water between 3AM and 9AM?



x	y
3	14
9	4

$$\frac{4-14}{9-3} = -\frac{5}{3}$$

To find y values
1) Type equation into Y=
2) 2nd Graph (Table)

7. For the function $f(x) = 3^x$, find the average rate of change over the interval -5 to -1 rounded to the nearest thousandth.

X	Y
-5	.00412
-1	.33333

$$\frac{.33333 - .00412}{-1 - -5} = .082$$

8. Find the average rate of change of the function $f(t) = 2500(0.97)^{4t}$ over the interval $10 \le t \le 15$ rounded to the nearest tenth.

X	Y
10	739.28
15	402.02

$$\frac{402.02 - 739.28}{15 - 10} = -67.5$$

9. The function $f(x) = 2^{-0.25x} \cdot \sin\left(\frac{\pi}{2}x\right)$ represents a damped sound wave function. What is the average rate of change for this function on the interval $[-7, 7]$, to the *nearest hundredth*?

X	Y
-7	3.3636
7	-.2973

$$\frac{-.2973 - 3.3636}{7 - -7}$$

$$-.26$$