Name: _____

CC Algebra - Function Practice

1) What is the average rate of change of y with respect to x from $x = 2$ to $x = 5$ when $y = x^2 - 3x$?

A) $\dfrac{8}{3}$ C) $\dfrac{1}{4}$ E) 4

B) 3   D) 1

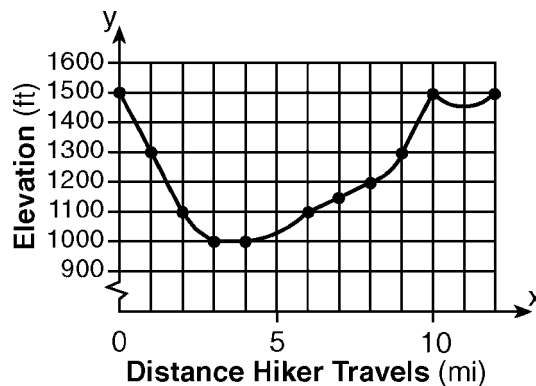2) The table below shows various values of function f on the interval [-2,3].

x	$f(x)$
-2	-16
-1	-3
0	0
1	-1
2	0
3	9

What is the average rate of change of function f on this interval?

Show your work.

Answer: _____

3) The accompanying graph shows the elevation of a certain region in New York State as a hiker travels along a trail.

What is the domain of this function?

A) $\{y \mid 0 \le y \le 12\}$

B) $\{x \mid 1{,}000 \le x \le 1{,}500\}$

C) $\{x \mid 0 \le x \le 12\}$
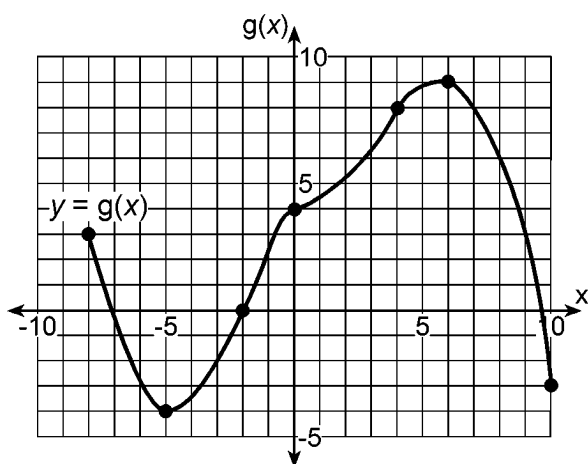
D) $\{y \mid 1{,}000 \le y \le 1{,}500\}$

4) The height, in feet, of a baseball t seconds after it leaves the bat is given by h(t) = -16t^2 + 45t + 4. What is the average rate of change of the height, in feet per second, from time $t = 0$ to $t = 2$?

Show your work.

Answer: _____ ft/sec

Questions 5 and 6 refer to the following:

Use the accompanying graph to compute the average rate of change of function f over the indicated interval:

5) [6,10]

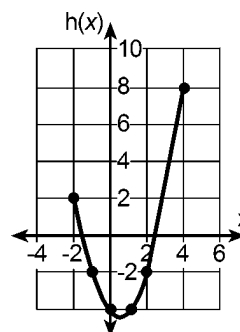**Show your work.**

Answer: _____

6) [-8,10]

Show your work.

Answer: _____

7) Given below are three functions f(x), g(x), and h(x).

(**A**) $f(x) = 2x^2 - 4x$

(**B**)

x	g(x)
-2	-6
0	8
2	10
4	14

(**C**)

Arrange these three functions in decreasing order from *greatest* to *least* in value for the average rate of change over the interval -2 ≤ x ≤ 4.

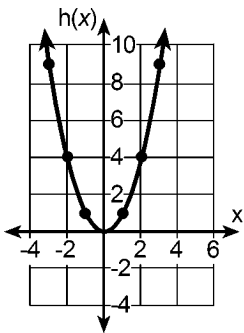**Show your work.**

Answer: _____

8) Given below are three functions f(x), g(x), and h(x).

(**A**) f(x) = 2x − 7

(**B**)

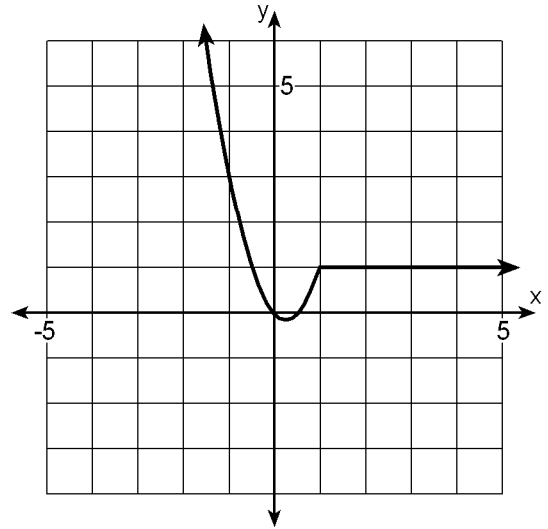| x	g(x)
-1	-8
1	0
2	6
3	16

(**C**)

Determine which of the functions have the same average rate of change over the interval -1 ≤ x ≤ 3.
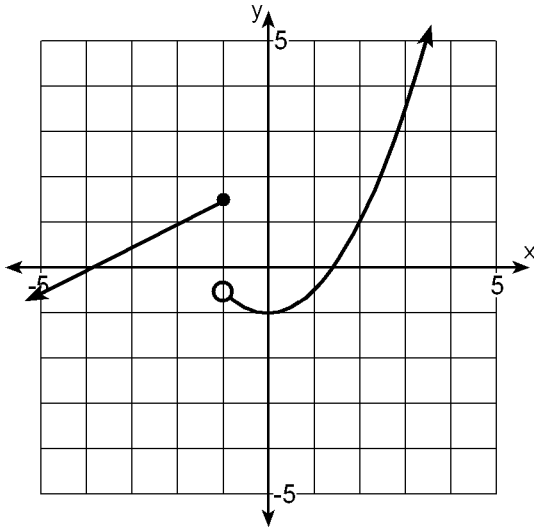
Show your work.

Answer: _____

9) Which of the following describes the graph shown?

A) $f(x) = \begin{cases} x^2 - 2x & \text{if } x > 1 \\ x & \text{if } x \le 1 \end{cases}$

B) $f(x) = \begin{cases} 2x^2 - x & \text{if } x < 1 \\ 1 & \text{if } x \ge 1 \end{cases}$

C) $f(x) = \begin{cases} 2x^2 - x & \text{if } x > 1 \\ 1 & \text{if } x \le 1 \end{cases}$

D) $f(x) = \begin{cases} x^2 - 2x & \text{if } x < 1 \\ x & \text{if } x \ge 1 \end{cases}$

10) Which of the following describes the graph shown?

A) $f(x) = \begin{cases} 2x + 2 & \text{if } x \le -1 \\ 2x^2 - 1 & \text{if } x > -1 \end{cases}$

B) $f(x) = \begin{cases} 2x + 2 & \text{if } x < -1 \\ 2x^2 - 1 & \text{if } x \ge -1 \end{cases}$

C) $f(x) = \begin{cases} \frac{1}{2}x + 2 & \text{if } x \le -1 \\ \frac{1}{2}x^2 - 1 & \text{if } x > -1 \end{cases}$

D) $f(x) = \begin{cases} \frac{1}{2}x + 2 & \text{if } x \ge -1 \\ \frac{1}{2}x^2 - 1 & \text{if } x < -1 \end{cases}$

Questions 11 through 16 refer to the following:

For the function $f(x) = \begin{cases} x^3 - 2 & \text{if } x \le 0 \\ x^2 & \text{if } 0 < x \le 1 \\ 2x - 1 & \text{if } x > 1 \end{cases}$, find the indicated functional value:

11) $f(1) = $ _____

12) $f(2) = $ _____

13) $f(-3) = $ _____

14) $f(-\frac{1}{2}) = $ _____

15) $f(0) = $ _____

16) $f(-1) = $ _____

1) E

2) 5

WORK SHOWN: $\dfrac{\Delta y}{\Delta x} = \dfrac{f(3) - f(-2)}{3 - (-2)} = \dfrac{9 - (-16)}{5} = \dfrac{25}{5} = 5$

3) C

4) 13 ft/sec

WORK SHOWN: $\dfrac{\Delta h}{\Delta t} = \dfrac{h(2) - h(0)}{(2 - 0)} = \dfrac{30 - 4}{2} = \dfrac{26}{2} = 13$

5) -3

WORK SHOWN: [6,10], $f(x) = \dfrac{g(10) - g(6)}{10 - 6} = \dfrac{-3 - 9}{4} = -\dfrac{12}{4} = -3$

6) $-\dfrac{1}{3}$

WORK SHOWN: [-8,10], $f(x) = \dfrac{g(10) - g(-8)}{10 - (-8)} = \dfrac{-3 - (3)}{18} = -\dfrac{6}{18} = -\dfrac{1}{3}$

7) $g(x), h(x), f(x)$ OR $B \rightarrow C \rightarrow A$

WORK SHOWN: $\dfrac{\Delta y}{\Delta x} = \dfrac{f(4) - f(-2)}{4 - (-2)} = \dfrac{16 - 16}{6} = \dfrac{0}{6} = 0;$

$\dfrac{\Delta y}{\Delta x} = \dfrac{g(4) - g(-2)}{4 - (-2)} = \dfrac{14 - (-6)}{6} = \dfrac{20}{6} = \dfrac{10}{3};$

$\dfrac{\Delta y}{\Delta x} = \dfrac{h(4) - h(-2)}{4 - (-2)} = \dfrac{8 - 2}{6} = \dfrac{6}{6} = 1$

8) $f(x)$ and $h(x)$ OR A and C

WORK SHOWN: $\dfrac{\Delta y}{\Delta x} = \dfrac{f(3) - f(-1)}{3 - (-1)} = \dfrac{-1 - (-9)}{4} = \dfrac{8}{4} = 2;$

$\dfrac{\Delta y}{\Delta x} = \dfrac{g(3) - g(-1)}{3 - (-1)} = \dfrac{16 - (-8)}{4} = \dfrac{24}{4} = 6;$

$\dfrac{\Delta y}{\Delta x} = \dfrac{h(3) - h(-1)}{3 - (-1)} = \dfrac{9 - 1}{4} = \dfrac{8}{4} = 2$

9) B   10) C

11) $f(1) = 1$

12) $f(2) = 3$

13) $f(-3) = -29$

14) $f(-\dfrac{1}{2}) = -\dfrac{17}{8}$

15) $f(0) = -2$

16) $f(-1) = -3$