Circuit Training

Unit 1 Review

Name: _____

Directions: Begin in cell #1. Show the work necessary to arrive at your answer. Search for your answer in one of the other cells and mark that cell #2, then work out the new problem. Proceed in this manner until you complete the circuit and arrive back at the first box. You do not need a calculator to complete this circuit.

#1 Answer: 76

Find the average rate of change for the function $g(x) = -5 + 3(x - 1)$ on the interval $[-2, 0]$.

#_____ Answer: 200

The approximate height of a rock, in meters, thrown upwards off a cliff, is $h(t) = -5t^2 + 10t + 100$ where t is time in seconds. What is the maximum height of the rock?

_____ Answer: 5

A linear function, $y = g(x)$, passes through the points $(-2, 7)$ and $(0, 5)$. Find the average rate of change of the function $y = g(x)$ on the interval $[1, 6]$.

_____ Answer: 3

The function f is quadratic. Selected values of f are shown in the table. Find the average rate of change of f on the interval $6 \leq x \leq 8$.

x	0	2	4	6	8
$f(x)$	-3	-3	5	21	45

_____ Answer: 3.5

The function f is quadratic. Select values of f are shown in the table. Solve $f(x) = 0$. The solutions are _____ and _____. To advance in the circuit, find the sum of the solutions: _____.

x	0	2	4	6	8
$f(x)$	-3	-3	5	21	45

_____ Answer: -4000

The function h is linear. Values of $h(x)$ for selected values of x are shown in the table. The function k is given by $k(x) = x^2 + 3h(x)$. What is the value of $k(-4)$?

x	0	10	100
$h(x)$	10	-15	-240

_____ Answer: $\frac{3}{2}$

Sarah is reading a very long book. (750 pages!). The function $P(h) = 650 + 40h$ models her page place in the book, P, based on the number of hours she has read, h. Sarah can devote at most 3 hours to reading today. The inequality $0 \leq h \leq k$ shows the domain of the function. What is k?

_____ Answer: -1

Family Friendly Food Truck has a chicken dinner for a family of four. The equation $R(x) = -\frac{1}{2}x(2x - 100)$ models the total revenue, in dollars, when x dollars is charged for 1 chicken dinner. At what price should the chicken dinner be set to maximize revenue?

_____ Answer: 2

Use the formula $\frac{(3+h)^2-(3)^2}{h}$ to find an expression for the slope between $x = 3$ and a nearby point $x = 3 + h$ on the graph of $f(x) = x^2$.

Simplified expression (in terms of h):

_____

To find the instantaneous rate of change at $x = 3$, evaluate your expression for $h = 0$. Search for this result.

_____ Answer: -3

The relationship between x and y represents a function.

x	-1	0	1	2	3	4	5
y	768	192	48	12	3	a	b

1. Explain why the function is not linear.

2. Explain why the function is not quadratic.

To advance in the circuit, search for $\frac{b}{a}$.

_____ Answer: 12

The function f is quadratic. Selected values of f are shown in the table. Find $f(1)$.

x	0	2	4	6	8
$f(x)$	-3	-3	5	21	45

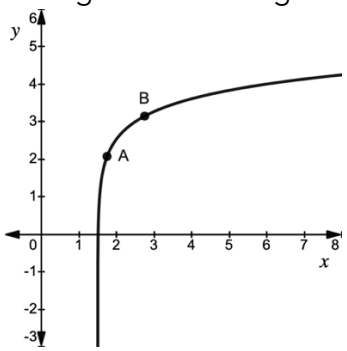
_____ Answer: 225

Georgina Orwell wants to fence in her pigs and plans to build a rectangular pen along one side of a preexisting barn (in this way she only needs fencing on three sides of the rectangle). If she has 400 feet of fencing, what are the dimensions that will maximize the area of the pen?

To advance in the circuit, search for the larger dimension.

_____ Answer: 15

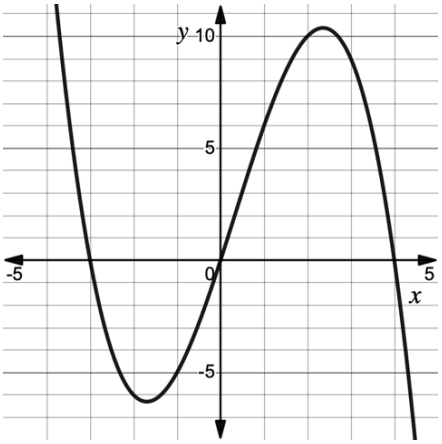
For the function pictured, which is greater… the instantaneous rate of change at point A or the average rate of change from point A to point B?



If the instantaneous rate of change at point A is greater, go to answer "5".
If the average rate of change from point A to point B is greater, go to answer "25".

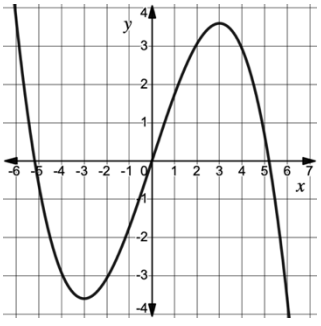
_____ Answer: 2.5

Determine the average rate of change of the function shown from $x = -1$ to $x = 3$.



_____ Answer: 105

The function pictured is decreasing and concave up on the interval $(-\infty, k)$. What is the value of k?



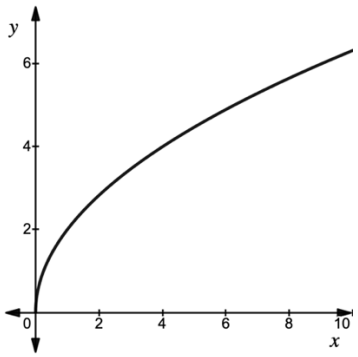
_____ Answer: -4

Decide whether the following table represents a linear or quadratic function. Once you decide which it is, find $b - a$.

x	-2	0	4	6	7	8
y	-8	-5	1	4	a	b

_____ Answer: 6

The graph of a function f is shown. Which statement describes the behavior of f?



Increasing at an increasing rate … go to 5
Increasing at a decreasing rate… go to 15
Decreasing at an increasing rate… go to 105
Decreasing at a decreasing rate… go to 225

_____ Answer: 25

The Lafayette Band Boosters purchased insulated tumblers to sell for a profit. They paid $15 for each tumbler and plan to sell them for $20 each. If they ordered 300 tumblers, how many do they have to sell in order to break even?

_____ Answer: $\frac{1}{4}$

The profit function for a reward bracelet manufacturing company is $P(x) = 2(x - 2000)$, where x is the number of bracelets sold and $P(x)$ is the profit in dollars.

(a) Find $P(1000)$ and explain what it means in the context of the problem.

(b) Solve $P(x) = 0$ and explain what it means in the context of the problem.

(c) Determine the y −intercept of the graph of P and explain what it means in the context of the problem.

To advance in the circuit look for your numeric answer to (c).