

Algebra Quarterly 3 Review Sheet 3

Question 1

Given the following quadratic functions:

$$g(x) = -x^2 - x + 6$$

and

x	-3	-2	-1	0	1	2	3	4	5
n(x)	-7	0	5	8	9	8	5	0	-7

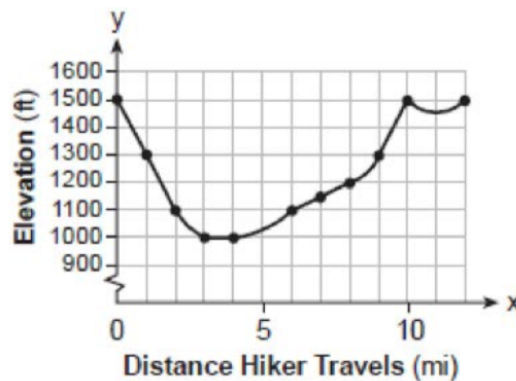
Which statement about these functions is true?

- | | |
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| <p>1) Over the interval $-1 \leq x \leq 1$, the average rate of change for $n(x)$ is less than that for $g(x)$.</p> <p>2) The y-intercept of $g(x)$ is greater than the y-intercept for $n(x)$.</p> | <p>3) The function $g(x)$ has a greater maximum value than $n(x)$.</p> <p>4) The sum of the roots of $n(x) = 0$ is greater than the sum of the roots of $g(x) = 0$.</p> |
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Question 2: Factored completely, the expression $2x^2 + 10x - 12$ is equivalent to:

- 1) $2(x - 6)(x + 1)$
- 2) $2(x + 6)(x - 1)$
- 3) $2(x + 2)(x + 3)$
- 4) $2(x - 2)(x - 3)$

Question 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?

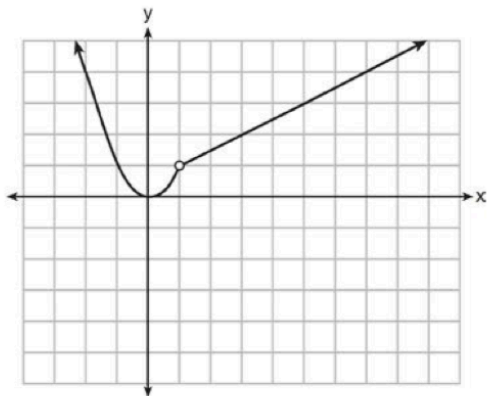
- 1) $1,000 \leq x \leq 1,500$
- 2) $1,000 \leq y \leq 1,500$
- 3) $0 \leq x \leq 12$
- 4) $0 \leq y \leq 12$

Question 4: If Lylah completes the square for $f(x) = x^2 - 12x + 7$ in order to find the minimum, she must write $f(x)$ in the general form $f(x) = (x - a)^2 + b$. What is the value of a for $f(x)$?

- 1) 6
- 2) -6
- 3) 12
- 4) -12

Question 5

A function is graphed on the set of axes below.



Which function is related to the graph?

- 1) $f(x) = \begin{cases} x^2, & x < 1 \\ x - 2, & x > 1 \end{cases}$
- 2) $f(x) = \begin{cases} x^2, & x < 1 \\ \frac{1}{2}x + \frac{1}{2}, & x > 1 \end{cases}$
- 3) $f(x) = \begin{cases} x^2, & x < 1 \\ 2x - 7, & x > 1 \end{cases}$
- 4) $f(x) = \begin{cases} x^2, & x < 1 \\ \frac{3}{2}x - \frac{9}{2}, & x > 1 \end{cases}$

Question 6

Consider the following polynomials: $A = 3x - 4$ and $B = 3 - 4x^3$

(a) Find AB

(b) State the leading coefficient, degree, and constant

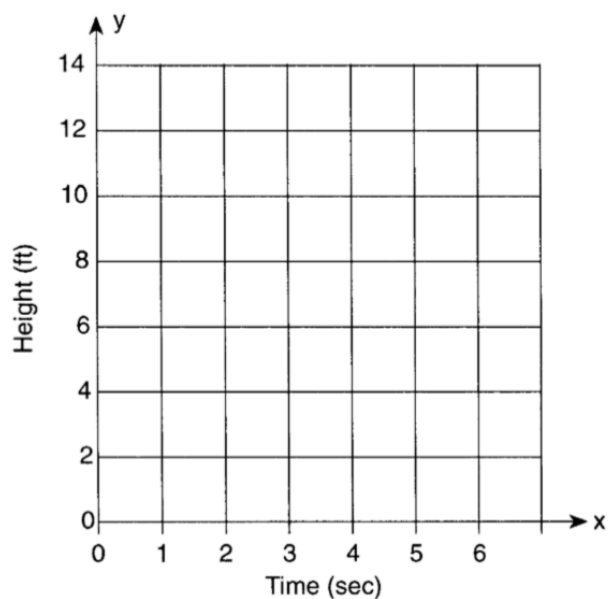
Question 7

Write an equation that defines $m(x)$ as a trinomial, where $m(x) = (3x - 1)(3 - x) + 4x^2 + 19$. Solve for x when $m(x) = 0$.

Question 8

Amy tossed a ball in the air in such a way that the path of the ball was modeled by the equation $y = -x^2 + 6x$. In the equation, y represents the height of the ball in feet and x is the time in seconds.

a. Graph $y = -x^2 + 6x$ for $0 \leq x \leq 6$ on the grid provided below.



b. At what time, x , is the ball at its highest point?

Question 9:

Rachel and Marc were given the information shown below about the bacteria growing in a Petri dish in their biology class.

Number of Hours, x	1	2	3	4	5	6	7	8	9	10
Number of Bacteria, $B(x)$	220	280	350	440	550	690	860	1070	1340	1680

Rachel wants to model this information with a linear function. Marc wants to use an exponential function. Which model is the better choice? Explain why you chose this model.

Answer Key

Question 1: 4

Question 2: 2

Question 3: 3

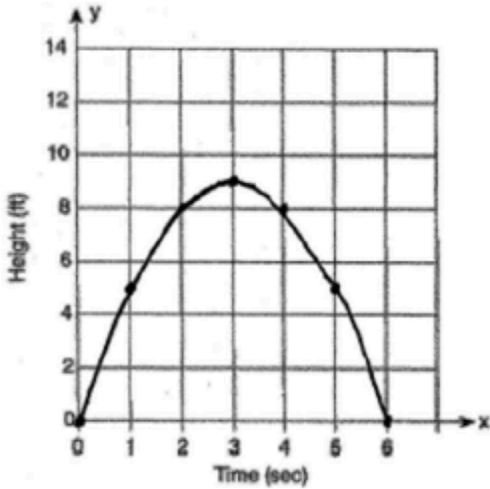
Question 4: 1

Question 5: 2

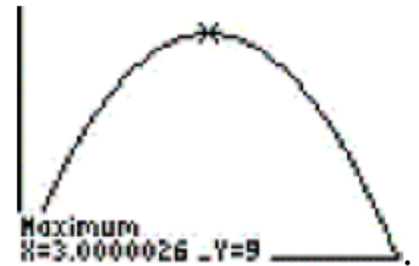
Question 6: $-12x^4 + 16x^3 + 9x - 12$. Leading coefficient = -12 . Degree = 4. Constant = -12

Question 7: $m(x) = x^2 + 10x + 16$. Solutions: $\{-8, -2\}$

Question 8:



$$3. \quad x = \frac{-b}{2a} = \frac{-(6)}{2(-1)} = 3.$$



Question 9: Exponential because the function does not grow at a constant rate and has a more approximate constant ratio.