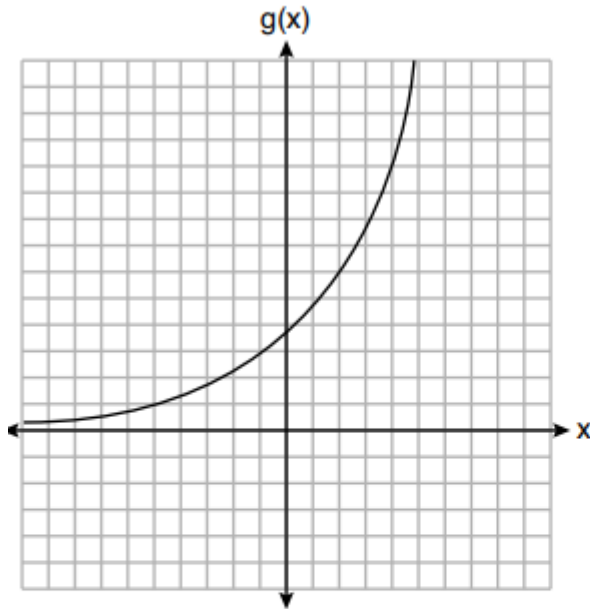


# Algebra 2 quick quiz 02082023

## Question 1.

Consider the graph of  $g$  and the table representing  $t$  below.



$x$	$t(x)$
-1	3
0	5
1	2
2	-5
3	-1
4	3

Over the interval  $[2, 4]$ , which statement regarding the average rate of change for  $g$  and  $t$  is true?

- (1)  $g$  has a greater average rate of change.
- (2) The average rates of change are equal.
- (3) The average rate of change for  $g$  is twice the average rate of change for  $t$ .
- (4) The average rate of change for  $g$  is half the average rate of change for  $t$ .

## Question 2

A parabola has a directrix of  $y = 3$  and a vertex at  $(2,1)$ . Which ordered pair is the focus of the parabola?

- (1)  $(2, -1)$
- (2)  $(2, 0)$
- (3)  $(2, 2)$
- (4)  $(2, 5)$

Question 3.

The inverse of  $f(x) = -6x + \frac{1}{2}$  is

(1)  $f^{-1}(x) = 6x - \frac{1}{2}$

(3)  $f^{-1}(x) = -\frac{1}{6}x + \frac{1}{12}$

(2)  $f^{-1}(x) = \frac{1}{-6x + \frac{1}{2}}$

(4)  $f^{-1}(x) = -\frac{1}{6}x + 2$

Question 4.

The expression  $\frac{x^2 + 12}{x^2 + 3}$  can be rewritten as

(1)  $\frac{10}{x^2 + 3}$

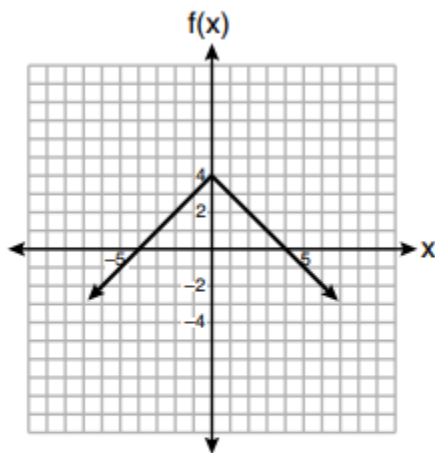
(3)  $x + 9$

(2)  $1 + \frac{9}{x^2 + 3}$

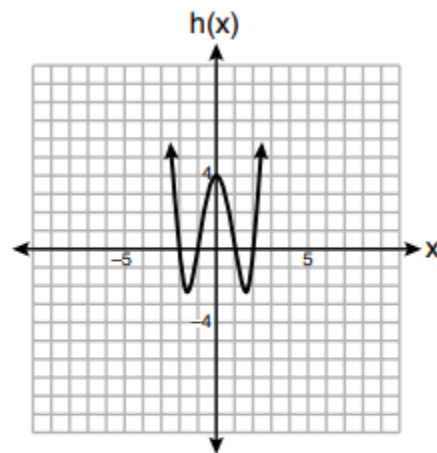
(4) 4

Question 5.

Which function has a maximum  $y$ -value of 4 and a midline of  $y = 1$ ?



(1)



(3)

$g(x) = -3\cos(x) + 1$

(2)

$j(x) = 4\sin(x) + 1$

(4)

Question 6.

Which expression is equivalent to  $(x + yi)(x^2 - xyi - y^2)$ , where  $i$  is the imaginary unit?

- (1)  $x^3 + y^3i$                       (3)  $x^3 - 2xy^2 - y^3i$   
(2)  $x^3 - xy^2 - (xy^2 + y^3)i$       (4)  $x^3 - y^3i$

Question 7.

The growth of a \$500 investment can be modeled by the function  $P(t) = 500(1.03)^t$ , where  $t$  represents time in years. In terms of the monthly rate of growth, the value of the investment can be best approximated by

- (1)  $P(t) = 500(1.00247)^{12t}$       (3)  $P(t) = 500(1.03)^{12t}$   
(2)  $P(t) = 500(1.00247)^t$       (4)  $P(t) = 500(1.03)^{\frac{t}{12}}$

Question 8.

Does the equation  $x^2 - 4x + 13 = 0$  have imaginary solutions? Justify your answer.

Question 9. Show your work on the back or on a separate sheet of paper.

The initial push of a child on a swing causes the swing to travel a total of 6 feet. Each successive swing travels 80% of the distance of the previous swing. Determine the total distance, to the *nearest hundredth of a foot*, a child travels in the first five swings.

Question 10. Show your work on the back or on a separate sheet of paper.

Solve algebraically for  $n$ :  $\frac{2}{n^2} + \frac{3}{n} = \frac{4}{n^2}$ .

Bonus Question

Question 11 Show working on the back of the answer paper.

A scientist places 7.35 grams of a radioactive element in a dish. The half-life of the element is 2 days. After  $d$  days, the number of grams of the element remaining in the dish is given by the function  $R(d) = 7.35\left(\frac{1}{2}\right)^{\frac{d}{2}}$ . Which statement is true about the equation when it is rewritten without a fractional exponent?

Select **all** that apply.

- A.** An approximately equivalent equation is  $R(d) = 7.35(0.250)^d$ .
- B.** An approximately equivalent equation is  $R(d) = 7.35(0.707)^d$ .
- C.** The base of the exponent in this form of the equation can be interpreted to mean that the element decays by 0.250 grams per day.
- D.** The base of the exponent in this form of the equation can be interpreted to mean that the element decays by 0.707 grams per day.
- E.** The base of the exponent in this form of the equation can be interpreted to mean that about 25% of the element remains from one day to the next day.
- F.** The base of the exponent in this form of the equation can be interpreted to mean that about 70.7% of the element remains from one day to the next day.