

Algebra 2 quick quiz 04032023

Question 1.

If $p(x) = x^3 - 3x^2 - x + 3$ and $p(3) = 0$, what is a factor of $p(x)$?

Select **all** that apply.

- A. $x - 1$
- B. $x + 1$
- C. $x - 2$
- D. $x + 2$
- E. $x - 3$
- F. $x + 3$

Question 2.

What is the solution of the equation $\sqrt{x - 2} = x - 4$?

Enter your answer in the box.

$x =$

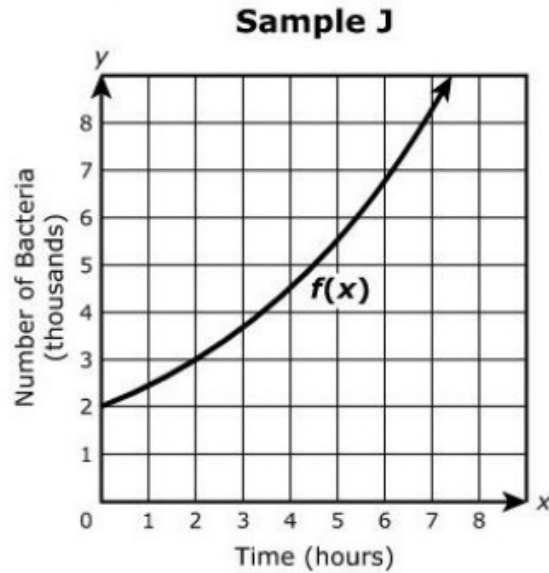
Question 3.

For a material with a half-life of 4 years, the amount remaining in a sample after t years can be found with the equation $f(t) = A\left(\frac{1}{2}\right)^{\frac{t}{4}}$, where A is the amount of material in the original sample. This function can be rewritten as $f(t) = A(b)^t$. What is the value of b ?

- A. $\left(\frac{1}{2}\right)^4$
- B. $\left(\frac{1}{2}\right)\left(\frac{1}{4}\right)$
- C. $\sqrt{\frac{1}{4}}$
- D. $\sqrt[4]{\frac{1}{2}}$

Question 4.

Researchers are studying two samples of bacteria whose growth can be modeled by exponential functions. The graph of $y = f(x)$ shows the number of bacteria in the thousands for sample J after x hours.



Part A

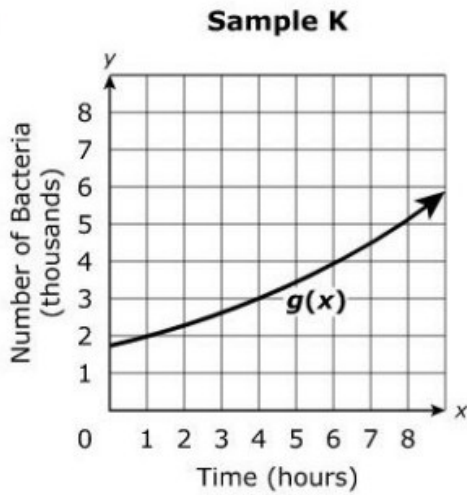
A researcher determines the number of bacteria in sample J at three different times of varying intervals, x_1 , x_2 , and x_3 , such that $x_1 < x_2 < x_3$. Based on the graph of $f(x)$, which statement must be true?

- A. $f(x_2) - f(x_1) > f(x_3) - f(x_2)$
- B. $f(x_3) - f(x_2) > f(x_2) - f(x_1)$
- C. $f(x_1) > f(x_3)$
- D. $f(x_2) > f(x_1)$

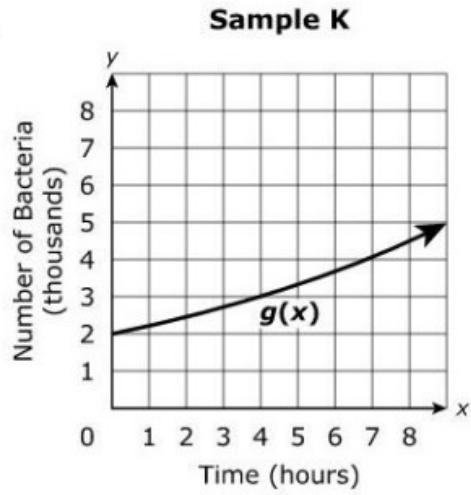
Part B

Sample J and sample K have the same number of bacteria initially. The number of bacteria in sample K at 4 hours is the same as the number of bacteria in sample J at 2 hours. Which graph shows the function $y = g(x)$, the number of bacteria, in thousands, for sample K after x hours?

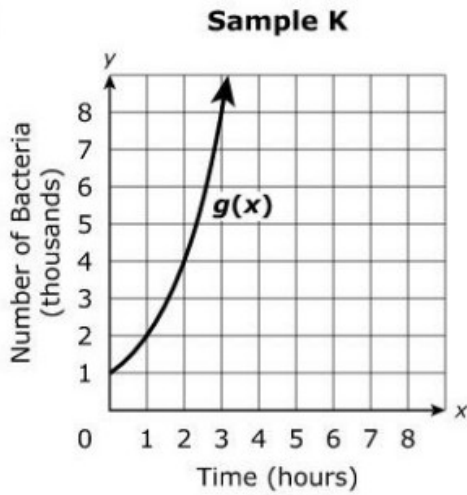
A.



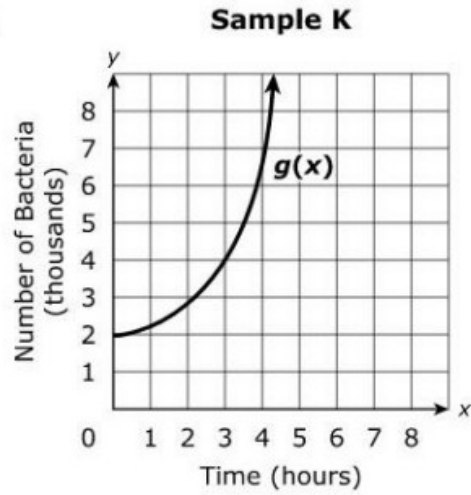
C.



B.



D.



Question 5.

What is the standard form of $(9 + 3i)^2$?

- A. 72
- B. 78
- C. $81 + 9i$
- D. $72 + 54i$

Question 6.

Which expression is equivalent to $\frac{9-x}{x^2-81}$ for $x \neq 9$ and $x \neq -9$?

- A. $\frac{-1}{x+9}$
- B. $\frac{1}{x+9}$
- C. $\frac{-x+9}{(x-9)(x-9)}$
- D. $\frac{x-9}{(x+9)(x-9)}$

Question 7.

Solve the quadratic equation $(2x - 3)^2 = 6(3 - 2x)$.

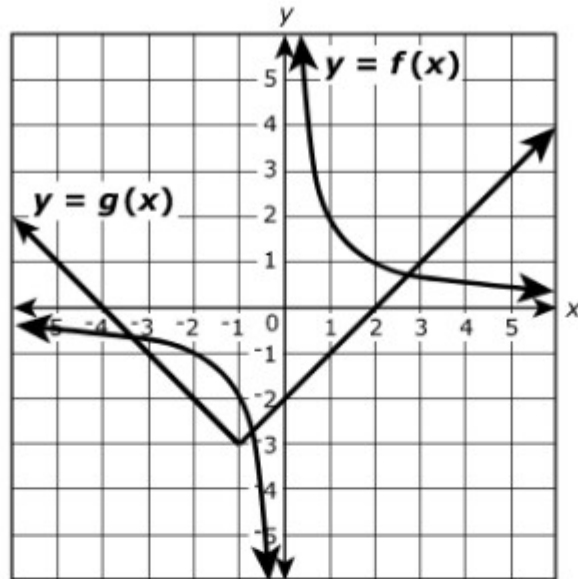
Select from the drop-down menus to correctly complete the sentence.

The solutions are and .

Choose...	Choose...
Choose...	Choose...
-2.25	-2.25
-1.5	-1.5
-1.0	-1.0
1	1
1.5	1.5
2.25	2.25

Question 8.

The graphs of a rational function $f(x)$ and an absolute value function $g(x)$ are shown in the coordinate plane.



Which intervals contain a solution of the equation $f(x) = g(x)$?

Select **all** that apply.

- A. $-4 < x < -3$
- B. $-3 < x < -2$
- C. $-2 < x < -1$
- D. $-1 < x < 0$
- E. $0 < x < 1$
- F. $1 < x < 2$
- G. $2 < x < 3$
- H. $3 < x < 4$

Question 9.

A soda geyser can be produced by placing candy in a bottle of soda. The number of candies, x , dropped into the bottle affects the height, y , in feet, of the soda geyser. The results from an experiment are given in the table.

Number of Candies	Height of Soda Geyser (in feet)
1	2
5	9
10	12
15	14
20	15

Part A

Based on the data in the table that the height of the soda geyser appears to increase at a decreasing rate as the number of candies increases, which of the following functions should be used to fit the data?

- A. a linear function
- B. a quadratic function
- C. a logarithmic function
- D. an exponential function

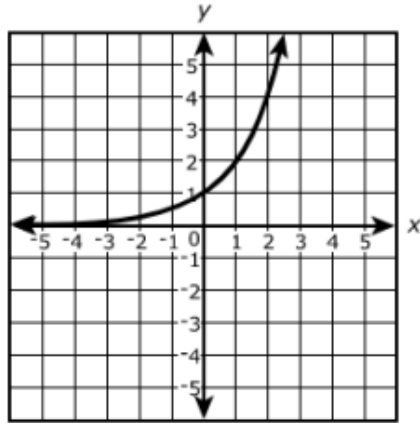
Part B

Based on the data in the table, which height is the most reasonable to expect if 25 candies were placed in the bottle?

- A. 16 feet
- B. 20 feet
- C. 24 feet
- D. 30 feet

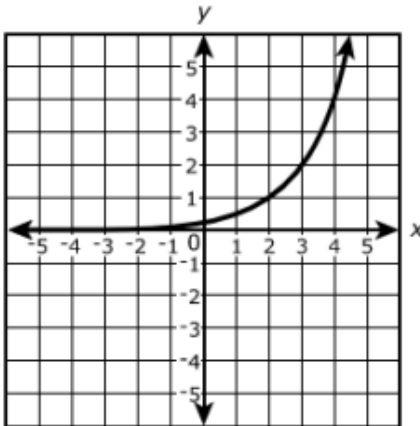
Question 10.

The graph of $y = f(x)$ is shown in the coordinate plane.

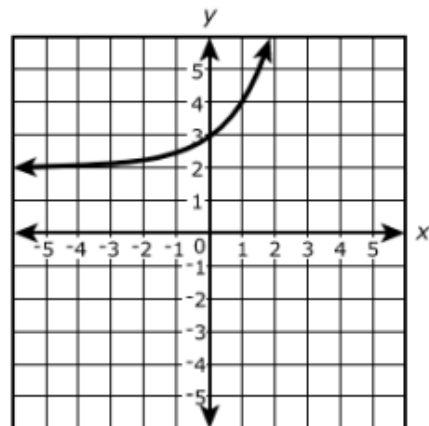


Which graph shows $y = f(x) - 2$?

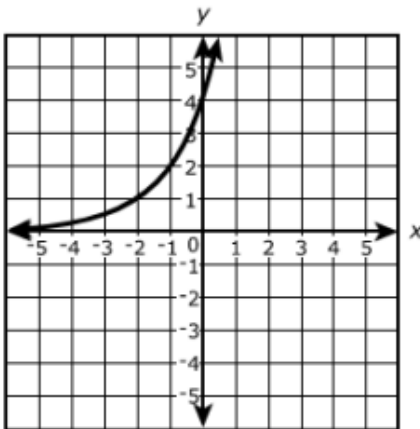
A.



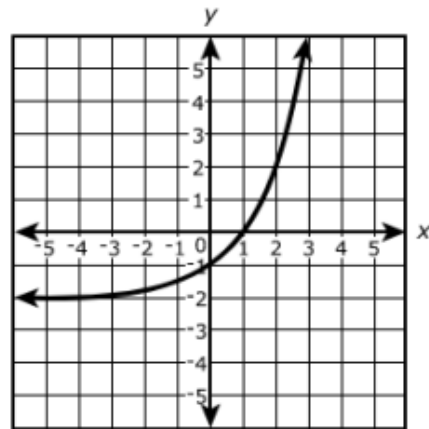
C.



B.



D.



Bonus Question

Question 11a.

The system of equations shown is graphed on the coordinate plane. The graphs of the equations form a line and a parabola that intersect at two points.

$$\begin{cases} x + y = 5 \\ x^2 + y = 11 \end{cases}$$

One point of intersection is $(3, 2)$. What are the coordinates of the other point?

Enter your answers in the boxes.

(,)

Question 11b.

Which of the choices listed is a solution to $2x^2 + 4x + 9 = 0$?

- A. $x = -1 - i\sqrt{14}$
- B. $x = -1 + \sqrt{14}$
- C. $x = \frac{-2 + \sqrt{14}}{2}$
- D. $x = \frac{-2 - i\sqrt{14}}{2}$