Algebra 2 quick quiz 02022023

Question 1.

Given the polynomial identity $x^6 + y^6 = (x^2 + y^2)(x^4 - x^2y^2 + y^4)$, which equation must also be true for all values of x and y?

(1) $x^6 + y^6 = x^2 (x^4 - x^2y^2 + y^4) + y^2(x^4 - x^2y^2 + y^4)$

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

(3) $(x^3 + y^3)^2 = (x^2 + y^2)(x^4 - x^2y^2 + y^4)$

(4) $(x^6 + y^6) - (x^2 + y^2) = x^4 - x^2y^2 + y^4$

Question 2

A company fired several employees in order to save money. The amount of money the company saved per year over five years following the loss of employees is shown in the table below.

Year	Amount Saved (in dollars)
1	59,000
2	64,900
3	71,390
4	78,529
5	86,381.9

Which expression determines the total amount of money saved by the company over 5 years?

(1) $\dfrac{59{,}000 - 59{,}000(1.1)^5}{1 - 1.1}$

(2) $\dfrac{59{,}000 - 59{,}000(0.1)^5}{1 - 0.1}$

(3) $\displaystyle\sum_{n=1}^{5} 59{,}000(1.1)^n$

(4) $\displaystyle\sum_{n=1}^{5} 59{,}000(0.1)^{n-1}$

Question 3.

A rush-hour commuter train has arrived on time 64 of its first 80 days. As arrivals continue, which equation can be used to find x, the number of consecutive days that the train must arrive on schedule to raise its on-time performance rate to 90%?

(1) $\frac{64}{80 + x} = \frac{90}{100}$

(2) $\frac{64 + x}{80 + x} = \frac{90}{100}$

(3) $\frac{64 + x}{80} = \frac{90}{100}$

(4) $\frac{x}{80 + x} = \frac{90}{100}$

Question 4.

Given $f(x) = -\frac{2}{5}x + 4$, which statement is true of the inverse function $f^{-1}(x)$?

(1) $f^{-1}(x)$ is a line with slope $\frac{5}{2}$.

(2) $f^{-1}(x)$ is a line with slope $\frac{2}{5}$.

(3) $f^{-1}(x)$ passes through the point $(6, -5)$.

(4) $f^{-1}(x)$ has a y-intercept at $(0, -4)$.

Question 5.

The amount of a substance, $A(t)$, that remains after t days can be given by the equation $A(t) = A_0(0.5)^{\frac{t}{0.0803}}$, where A_0 represents the initial amount of the substance. An equivalent form of this equation is

(1) $A(t) = A_0(0.000178)^t$

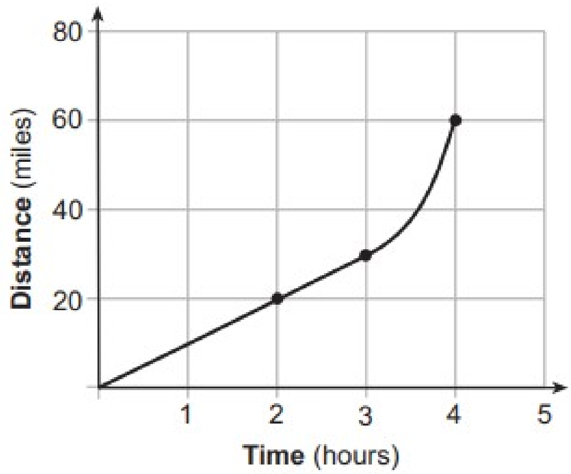
(2) $A(t) = A_0(0.945861)^t$

(3) $A(t) = A_0(0.04015)^t$

(4) $A(t) = A_0(1.08361)^t$

Question 6. Show working on an extra sheet of paper.

Determine the average rate of change, in mph, from 2 to 4 hours on the graph shown below.



Question 7. Show working on an extra sheet of paper.

Factor the expression $x^3 - 2x^2 - 9x + 18$ completely.

Question 8. Show working on an extra sheet of paper.

Solve algebraically for all values of x:

$$\sqrt{4x + 1} = 11 - x$$

Question 9. Show working on an extra sheet of paper.

Given that $\left(\frac{y^{\frac{17}{8}}}{y^{\frac{5}{4}}}\right)^{-4} = y^n$, where $y > 0$, determine the value of n.

Question 10. Show working on an extra sheet of paper.

Algebraically determine the solution set for the system of equations below.

$$y = 2x^2 - 7x + 4$$
$$y = 11 - 2x$$

Bonus Question

Question 11

Given $p(\theta) = 3\sin\left(\frac{1}{2}\theta\right)$ on the interval $-\pi < \theta < \pi$, the function p

(1) decreases, then increases

(2) increases, then decreases

(3) decreases throughout the interval

(4) increases throughout the interval