Algebra 2 quick quiz 02222023

Question 1.

Written in simplest form, the fraction $\frac{x^3-9x}{9-x^2}$, where $x \neq \pm 3$, is equivalent to

(1) $-x$

(2) x

(3) $\frac{-x(x+3)}{(3+x)}$

(4) $\frac{x(x-3)}{(3-x)}$

Question 2. Use an extra sheet of paper to show your working.

For n and $p > 0$, is the expression $\left(p^2 n^{\frac{1}{2}}\right)^8 \sqrt{p^5 n^4}$ equivalent to $p^{18} n^6 \sqrt{p}$? Justify your answer.

Question 3. Use an extra sheet of paper to show your working.

Show why $x - 3$ is a factor of $m(x) = x^3 - x^2 - 5x - 3$. Justify your answer.

Question 4. Use an extra sheet of paper to show your working.

Describe the transformation applied to the graph of $p(x) = 2^x$ that forms the new function $q(x) = 2^{x-3} + 4$.

Question 5.

The parabola $y = -\frac{1}{20}(x-3)^2 + 6$ has its focus at (3,1). Determine and state the equation of the directrix.

Question 6.

When the expression $(x + 2)^2 + 4(x + 2) + 3$ is rewritten as the product of two binomials, the result is

(1) $(x + 3)(x + 1)$
(2) $(x + 5)(x + 3)$
(3) $(x + 2)(x + 2)$
(4) $(x + 6)(x + 1)$

Question 7.

The first term of a geometric sequence is 8 and the fourth term is 216. What is the sum of the first 12 terms of the corresponding series?

(1) 236,192
(2) 708,584
(3) 2,125,760
(4) 6,377,288

Question 8.

Perry invested in property that cost him \$1500. Five years later it was worth \$3000, and 10 years from his original purchase, it was worth \$6000. Assuming the growth rate remains the same, which type of function could he create to find the value of his investment 30 years from his original purchase?

(1) exponential function
(2) linear function
(3) quadratic function
(4) trigonometric function

Question 9.

If $(a^3 + 27) = (a + 3)(a^2 + ma + 9)$, then m equals

(1) -9
(2) -3
(3) 3
(4) 6

Question 10.

A veterinary pharmaceutical company plans to test a new drug to treat a common intestinal infection among puppies. The puppies are randomly assigned to two equal groups. Half of the puppies will receive the drug, and the other half will receive a placebo. The veterinarians monitor the puppies.

This is an example of which study method?

(1) census
(2) observational study
(3) survey
(4) controlled experiment

Bonus Question

Question 11.

At noon, a tank contains 100 gallons of water. The table shows the input and output of water for pipes A, B, and C. The pipes begin operating simultaneously at noon.

Pipe	A	B	C
Flow in (gallons per minute)	$a(x) = 25x$	$b(x) = 10x$	
Flow out (gallons per minute)			$c(x) = 30x$

Let $T(x)$ represent the amount of water in the tank x minutes after all of pipes A, B, and C are opened. Which function represents $T(x)$?

A. $T(x) = 100 + a(x) + b(x) + c(x)$

B. $T(x) = a(x) + b(x) - c(x)$

C. $T(x) = 100 + a(x) + b(x) - c(x)$

D. $T(x) = a(x) + b(x) + c(x)$