Algebra 2 quick quiz 02272023

Question 1.

The expression $2 - \frac{x-1}{x+2}$ is equivalent to

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

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

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

(4) $1 + \frac{1}{x+2}$

Question 2.

Which description could represent the graph of $f(x) = 4x^2(x + a) - x - a$, if a is an integer?

(1) As $x \to -\infty$, $f(x) \to \infty$, as $x \to \infty$, $f(x) \to \infty$, and the graph has 3 x-intercepts.

(2) As $x \to -\infty$, $f(x) \to -\infty$, as $x \to \infty$, $f(x) \to \infty$, and the graph has 3 x-intercepts.

(3) As $x \to -\infty$, $f(x) \to \infty$, as $x \to \infty$, $f(x) \to -\infty$, and the graph has 4 x-intercepts.

(4) As $x \to -\infty$, $f(x) \to -\infty$, as $x \to \infty$, $f(x) \to \infty$, and the graph has 4 x-intercepts.

Question 3.

After Roger's surgery, his doctor administered pain medication in the following amounts in milligrams over four days.

Day (n)	1	2	3	4
Dosage (m)	2000	1680	1411.2	1185.4

How can this sequence best be modeled recursively?

(1) $m_1 = 2000$
$m_n = m_{n-1} - 320$

(3) $m_1 = 2000$
$m_n = (0.84)m_{n-1}$

(2) $m_n = 2000(0.84)^{n-1}$

(4) $m_n = 2000(0.84)^{n+1}$

Question 4.

The expression $\dfrac{9x^2 - 2}{3x + 1}$ is equivalent to

(1) $3x - 1 - \dfrac{1}{3x + 1}$

(3) $3x + 1 - \dfrac{1}{3x + 1}$

(2) $3x - 1 + \dfrac{1}{3x + 1}$

(4) $3x + 1 + \dfrac{1}{3x + 1}$

Question 5.

If $f(x)$ is an even function, which function must also be even?

(1) $f(x - 2)$

(3) $f(x + 1)$

(2) $f(x) + 3$

(4) $f(x + 1) + 3$

Question 6.

Given $y > 0$, the expression $\sqrt{3x^2 y} \cdot \sqrt[3]{27x^3 y^2}$ is equivalent to

(1) $81x^5 y^3$

(3) $3^{\frac{5}{2}} x^2 y^{\frac{5}{3}}$

(2) $3^{1.5} x^2 y$

(4) $3^{\frac{3}{2}} x^2 y^{\frac{7}{6}}$

Question 7.

What is the solution set of the equation $\dfrac{10}{x^2 - 2x} + \dfrac{4}{x} = \dfrac{5}{x - 2}$?

(1) $\{0,2\}$

(3) $\{2\}$

(2) $\{0\}$

(4) $\{\ \}$

Question 8.

What are the solution(s) to the system of equations shown below?

$$x^2 + y^2 = 5$$
$$y = 2x$$

(1) $x = 1$ and $x = -1$ (3) $(1, 2)$ and $(-1, -2)$

(2) $x = 1$ (4) $(1, 2)$, only

Question 9.

If \$5000 is put into a savings account that pays 3.5% interest compounded monthly, how much money, to the *nearest ten cents*, would be in that account after 6 years, assuming no money was added or withdrawn?

(1) \$5177.80   (3) \$6146.30

(2) \$5941.30   (4) \$6166.50

Question 10.

The Fahrenheit temperature, $F(t)$, of a heated object at time t, in minutes, can be modeled by the function below. F_s is the surrounding temperature, F_0 is the initial temperature of the object, and k is a constant.

$$F(t) = F_s + (F_0 - F_s)e^{-kt}$$

Coffee at a temperature of 195°F is poured into a container. The room temperature is kept at a constant 68°F and $k = 0.05$. Coffee is safe to drink when its temperature is, at most, 120°F. To the *nearest minute*, how long will it take until the coffee is safe to drink?

(1) 7   (3) 11

(2) 10   (4) 18

Bonus Question

Question 11.

Let x and y represent natural numbers. Prove that the following equation is true for all x and y values. Show your work or explain your answer.

$$\left(x^2 + y^2\right)^2 - \left(x^2 - y^2\right)^2 = (2xy)^2$$