Algebra 2 quick quiz 02162023

Question 1.

Given $x \neq -2$, the expression $\dfrac{2x^2 + 5x + 8}{x + 2}$ is equivalent to

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

(3) $2x + 1 + \dfrac{6}{x + 2}$

(2) $2x + \dfrac{7}{x + 2}$

(4) $2x + 9 - \dfrac{10}{x + 2}$

Question 2

What is the solution set of $x = \sqrt{3x + 40}$?

(1) $\{-5,8\}$

(3) $\{-4,10\}$

(2) $\{8\}$

(4) $\{\ \}$

Question 3.

Consider the data in the table below.

	Right Handed	Left Handed
Male	87	13
Female	89	11

What is the probability that a randomly selected person is male given the person is left handed?

(1) $\dfrac{13}{200}$

(3) $\dfrac{13}{50}$

(2) $\dfrac{13}{100}$

(4) $\dfrac{13}{24}$

Question 4.

The function $N(x) = 90(0.86)^x + 69$ can be used to predict the temperature of a cup of hot chocolate in degrees Fahrenheit after x minutes. What is the approximate average rate of change of the temperature of the hot chocolate, in degrees per minute, over the interval $[0, 6]$?

(1) -8.93 (3) 0.11

(2) -0.11 (4) 8.93

Question 5.

A recursive formula for the sequence $40, 30, 22.5, \ldots$ is

(1) $g_n = 40\left(\frac{3}{4}\right)^n$

(2) $g_1 = 40$
$\quad g_n = g_{n-1} - 10$

(3) $g_n = 40\left(\frac{3}{4}\right)^{n-1}$

(4) $g_1 = 40$
$\quad g_n = \frac{3}{4}g_{n-1}$

Question 6.

Consider the following patterns:

   I. $16, -12, 9, -6.75, \ldots$
   II. $1, 4, 9, 16, \ldots$
   III. $6, 18, 30, 42, \ldots$
   IV. $\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \ldots$

Which pattern is geometric?

(1) I   (3) III

(2) II   (4) IV

Question 7.

Consider the system below.

$$x + y + z = 9$$
$$x - y - z = -1$$
$$x - y + z = 21$$

Which value is *not* in the solution, (x,y,z), of the system?

(1) -8 (3) 11

(2) -6 (4) 4

Question 8.

Which statement regarding polynomials and their zeros is true?

(1) $f(x) = (x^2 - 1)(x + a)$ has zeros of 1 and $-a$, only.

(2) $f(x) = x^3 - ax^2 + 16x - 16a$ has zeros of 4 and a, only.

(3) $f(x) = (x^2 + 25)(x + a)$ has zeros of ± 5 and $-a$.

(4) $f(x) = x^3 - ax^2 - 9x + 9a$ has zeros of ± 3 and a.

Question 9.

If a solution of $2(2x - 1) = 5x^2$ is expressed in simplest $a + bi$ form, the value of b is

(1) $\dfrac{\sqrt{6}}{5}i$ (3) $\dfrac{1}{5}i$

(2) $\dfrac{\sqrt{6}}{5}$ (4) $\dfrac{1}{5}$

Question 10.

Expressed in simplest $a + bi$ form, $(7 - 3i) + (x - 2i)^2 - (4i + 2x^2)$ is

(1) $(3 - x^2) - (4x + 7)i$ (3) $(3 - x^2) - 7i$

(2) $(3 + 3x^2) - (4x + 7)i$ (4) $(3 + 3x^2) - 7i$

Bonus Question

Question 11.

Town A has a population size of 4,000 and is predicted to increase in size by 8% each year. Town B has a population size of 5,000 and is predicted to increase in size by 6% each year.

Part A

Which statement **best** compares the size of the populations of the towns in 5 years?

○ A. The size of the population in Town A will be greater than that of Town B with a difference less than 1,000 people.

○ B. The size of the population in Town A will be greater than that of Town B with a difference greater than 1,000 people.

○ C. The size of the population in Town B will be greater than that of Town A with a difference less than 1,000 people.

○ D. The size of the population in Town B will be greater than that of Town A with a difference greater than 1,000 people.

Part B

If the predictions are correct, the two populations will be equal in size at some point in time. To the nearest person, which is the **best** estimate of the size of each population at the point in time when they are equal?

○ A. 8,636 people

○ B. 9,919 people

○ C. 10,025 people

○ D. 10,878 people