Algebra Quick-Quiz-04062022

Question 1

Bryan's hockey team is purchasing jerseys. The company charges $250 for a onetime set-up fee and $23 for each printed jersey. Which expression represents the total cost of x number of jerseys for the team?

(1) $23x$

(2) $23 + 250x$

(3) $23x + 250$

(4) $23(x + 250)$

Question 2

Which table represents a function?

x	y
2	–3
3	0
4	–3
2	1

(1)

x	y
–3	0
–2	1
–3	2
2	3

(3)

x	y
1	2
1	3
1	4
1	5

(2)

x	y
–2	–4
0	2
2	4
4	6

(4)

Question 3.

Which expression is equivalent to $2(x^2 - 1) + 3x(x - 4)$?

(1) $5x^2 - 5$

(2) $5x^2 - 6$

(3) $5x^2 - 12x - 1$

(4) $5x^2 - 12x - 2$

Question 4.

What are the zeros of the polynomial $x(x^2 + 4x - 12)$?

Indicate **all** zeros.

- ☐ A. -12
- ☐ B. -6
- ☐ C. -3
- ☐ D. -2
- ☐ E. 0
- ☐ F. 2
- ☐ G. 6
- ☐ H. 12

Question 5.

The value of x that satisfies the equation $\frac{4}{3} = \frac{x+10}{15}$ is

(1) -6
(2) 5
(3) 10
(4) 30

Question 6.

Josh graphed the function $f(x) = -3(x - 1)^2 + 2$. He then graphed the function $g(x) = -3(x - 1)^2 - 5$ on the same coordinate plane. The vertex of $g(x)$ is

(1) 7 units below the vertex of $f(x)$

(2) 7 units above the vertex of $f(x)$

(3) 7 units to the right of the vertex of $f(x)$

(4) 7 units to the left of the vertex of $f(x)$

Question 7.

Which expression is equivalent to $162x^4 - 144x^2 + 32$?

Select **all** that apply.

- ☐ A. $2(81x^2 - 72x + 16)$
- ☐ B. $2(81x^2 + 4)(81x^2 + 4)$
- ☐ C. $2(81x^2 - 4)(81x^2 + 4)$
- ☐ D. $2(9x^2 - 4)(9x^2 - 4)$
- ☐ E. $2(9x^2 + 4)(9x^2 + 4)$
- ☐ F. $2(3x + 2)^2(3x - 2)^2$

Question 8.

The expression $16x^2 - 81$ is equivalent to

(1) $(8x - 9)(8x + 9)$

(2) $(8x - 9)(8x - 9)$

(3) $(4x - 9)(4x + 9)$

(4) $(4x - 9)(4x - 9)$

Question 9.

A ball is thrown into the air from the top of a building. The height, $h(t)$, of the ball above the ground t seconds after it is thrown can be modeled by $h(t) = -16t^2 + 64t + 80$. How many seconds after being thrown will the ball hit the ground?

(1) 5
(2) 2
(3) 80
(4) 144

Question 10.

Solve $7(x - 2) = 7x + 14$.

a. no solution
b. 0
c. 2
d. all real numbers

Bonus Question

Question 11a.

A student claims that there is no solution to the system of inequalities shown.

$$\begin{cases} y \geq x^2 + 3 \\ y < \frac{x}{2} + 1 \end{cases}$$

- Explain a method for proving that the student's claim is correct.
- Identify a single change that could be made to the system of inequalities so that it does have a solution set. Explain your answer.
- Give an ordered pair that would be part of the solution that results from your change.

Question 11b.

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.

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