Algebra 2 quick quiz 03312023

Question 1.

Let $p(x) = x^3 - 3x^2 - 10x + 24$. What is the remainder when $p(x)$ is divided by $x - 1$?

- ⊙ A. 0

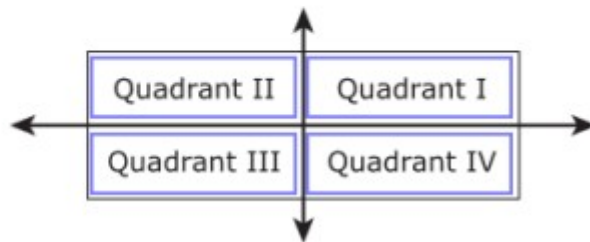- ⊙ B. 12

- ⊙ C. 24

- ⊙ D. 30

Question 2.

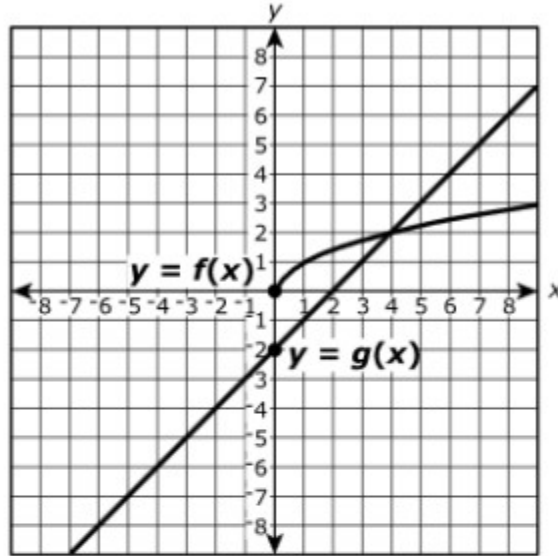A logarithmic function is defined below.

$$f(x) = \log x$$

In which quadrant(s) is the graph of f?

Select **each** correct quadrant.

Quadrant II	Quadrant I
Quadrant III	Quadrant IV

Question 3.

The graphs of the functions $f(x) = \sqrt{x}$ and $g(x) = x - 2$ are shown in the xy-coordinate plane.

When the equation $\sqrt{x} = x - 2$ is solved by squaring both sides of the equation, the algebraic solutions to the squared equation are $x = 1$ and $x = 4$. What do the graphs of f and g reveal about the solutions?

Select from the drop-down menus to correctly complete the sentence.

The graphs reveal that

| both 1 and 4 are solutions |
| 4 is a solution and 1 is not a solution |
| neither 1 nor 4 is a solution |
| 1 is a solution and 4 is not a solution |

to the equation

$\sqrt{x} = x - 2$ because

| f and g intersect at x = 4 and do not intersect at x = 1 |
| f is a linear function and g is not a linear function f |
| and g have different y-intercepts |

Question 4.

The variables z_1 and z_2 are defined as $z_1 = 6 + 3i$ and $z_2 = 10 + 8i$. Which expression is equivalent to $z_1 z_2$?

- A. $84 + 78i$

- B. $36 + 78i$

- C. $60 + 54i$

- D. $16 + 11i$

Question 5.

$$(\sqrt{x})^2 - 6\sqrt{x} = -8$$

Which values of x are solutions to the equation shown?

Select **all** that apply.

- A. 0

- B. 4

- C. 7

- D. 8

- E. 14

- F. 16

Question 6.

On a TV game show, contestants win money for correctly answering trivia questions. The first question is worth $1,000. The value of each subsequent question is two times the value of the previous question.

Part A

If a contestant answers the first 5 questions correctly, how much money will the contestant win?

Enter your answer in the box.

The contestant will win $ ☐ .

Part B

Contestant A answers the first 3 questions correctly. Contestant B answers the first 10 questions correctly. Which expression can be used to calculate how much more contestant B will win than contestant A?

- A. $\dfrac{1{,}000(1-2)^{10}}{1-2} - \dfrac{1{,}000(1-2)^3}{1-2}$

- B. $\dfrac{1{,}000(1-2^{10})}{1-2} - \dfrac{1{,}000(1-2^3)}{1-2}$

- C. $1{,}000(1-2)^9 - 1{,}000(1-2)^2$

- D. $1{,}000\left(1-2^9\right) - 1{,}000\left(1-2^2\right)$

Question 7.

Which equation has non-real solutions?

- A. $3x^2 - 2x - 5 = 0$

- B. $4x^2 - 3x + 3 = 0$

- C. $4x^2 + 12x + 9 = 0$

- D. $6x^2 + 5x - 6 = 0$

Question 8.

An airplane is flying at an altitude of 30,000 feet. The distance, d, in feet, from an observer on the ground to the plane is a function of the angle of elevation, θ, defined as the acute angle between the ground and the line between the observer and the plane, as shown in the figure.
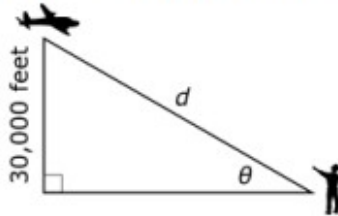
Part A

Which equation gives d as a function of θ?

○ A. $d(\theta) = \dfrac{30,000}{\sin \theta}$

○ B. $d(\theta) = \dfrac{\sin \theta}{30,000}$

○ C. $d(\theta) = \dfrac{30,000}{\cos \theta}$

○ D. $d(\theta) = \dfrac{\cos \theta}{30,000}$

Part B

Within the context of the situation described, what is the domain of the function d? Enter the appropriate values, in degrees, in the inequality.

Enter your answer in the boxes.

[   ]° < θ < [   ]°

Part C

When the angle of elevation is 75 degrees, what is the distance between the observer and the plane, to the nearest foot?

Enter your answer in the box.

[   ] feet

Part D

For what value of θ will the distance between the observer and the plane be 60,000 feet?

Enter your answer in the box.

[   ] degrees

Question 9.

The expression 8^x is equivalent to 32^y, where x and y are positive. What is the value of $\frac{y}{x}$?

○ A. $\frac{1}{4}$

○ B. $\frac{3}{5}$

○ C. $\frac{5}{3}$

○ D. 4

Question 10.

What are the solutions of the equation $x^2 - 4x + 5 = 0$?

Select **all** solutions.

☐ A. $2 + i$

☐ B. $2 - i$

☐ C. $2 + 2i$

☐ D. $2 - 2i$

☐ E. 5

☐ F. -1

Bonus Question

Question 11a.

A system of three equations is given.

$$\begin{cases} 2x - 3y + z = -2 \\ x + 6y - 2z = -6 \\ x + 3y = 1 \end{cases}$$

What is the solution (x, y, z)?

Enter your answers in the boxes.

([ ] , [ ] , [ ])

Question 11b.

A certain computer loses half of its value every **two** years.

Part A

After how many years will the computer be worth 12.5% of its initial value?

Enter your answer in the box.

[ ] years

Part B

If the value of the computer after 3 years is $425, what was the initial value of the computer?

○ A. $601.04

○ B. $850.00

○ C. $1,202.08

○ D. $2,404.16