

Algebra 2 quick quiz 03242023

Question 1.

The table shows the steps and explanations that can be used to solve $\sqrt{x} - 5x = -4$.

| | Work | Explanation |
|--------|-----------------------------------|-----------------------------------|
| | $\sqrt{x} - 5x = -4$ | Given |
| Step 1 | $\sqrt{x} = 5x - 4$ | Addition property of equality |
| Step 2 | $x = 25x^2 - 40x + 16$ | Square both sides of the equation |
| Step 3 | $0 = 25x^2 - 41x + 16$ | Subtraction property of equality |
| Step 4 | $0 = (25x - 16)(x - 1)$ | Factor |
| Step 5 | $(25x - 16) = 0$ or $(x - 1) = 0$ | Zero product property |
| Step 6 | $25x = 16$ or $x = 1$ | Addition property of equality |
| Step 7 | $x = \frac{16}{25}$ or $x = 1$ | Division property of equality |

Which step in the table could have created an extraneous solution?

- A. Step 1
- B. Step 2
- C. Step 4
- D. Step 5

Question 2.

Which quadratic equation has nonreal roots?

- A. $x^2 - 4x + 3 = 0$
- B. $x^2 - 4x + 4 = 0$
- C. $x^2 - 4x + 5 = 0$
- D. $x^2 - 5x + 6 = 0$

Question 3.

Which equations are true for all values of x ?

Select **all** that apply.

A. $3^{2-x} = 3^2 - 3^x$

B. $3^{x+2} = 9(3^x)$

C. $(3^x)^2 = (3^2)^x$

D. $9^{x+2} = 3^{2x+4}$

E. $27^x = (3^x)^3$

Question 4.

For the values listed in the table, i represents the imaginary unit. Select **all** the cells in the table for which the product of the row value and the column value is -1 .

| Value | i^4 | i^5 | i^6 |
|-------|--------------------------|--------------------------|--------------------------|
| i | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| i^2 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| i^3 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Question 5.

. For what value of m is the equation true?

$$x^2 + 10x + 11 = m + (x + 5)^2 - 25$$

Enter your answer in the box.

Question 6.

What is $\sqrt{-5}$ in the form $a + bi$?

Enter your answer in the space provided. Enter **only** your answer.

Question 7.

A city offered a program that provided incentives for residents who purchased energy-efficient appliances. During a certain year, participation in the program increased exponentially by 25 percent. What was the monthly rate of increase, expressed as a percent? Round your answer to one decimal place.

Enter your answer in the box.

 %

Question 8.

One zero for $x^2 - 10x + 169 = 0$ is $x = 5 + 12i$. Find the second zero for $x^2 - 10x + 169 = 0$.

Enter your answer in the space provided. Enter **only** your answer.

Question 9.

Functions f and g are defined as $f(x) = 2^x$ and $g(x) = x + 3$.

What are the values of x to the nearest hundredth when $f(x) = g(x)$?

Enter your answers in the boxes.

$x_1 = \text{[]}$

$x_2 = \text{[]}$

Question 10.

A company that manufactures memory chips for digital cameras uses the formula $c = 3\sqrt{n} (40\sqrt[6]{n} + 9\sqrt[4]{n})$ to determine the cost, c , in dollars, for producing n chips. This formula can be written as $c = 120\sqrt[3]{n^a} + 27\sqrt[4]{n^b}$, where a and b are constants. What are the values of a and b ?

Enter your answers in the boxes.

$a = \text{[]}, b = \text{[]}$

Bonus Question

Question 11.

To prepare for a test, three students have been asked to present a review lesson to their class on sketching the graph of a parabola in the xy -coordinate plane. They decide to use the quadratic function $f(x) = 4x^2 + 8x - 5$ in their presentation. Each student will use algebra to explain how to find one of three key features of the graph.

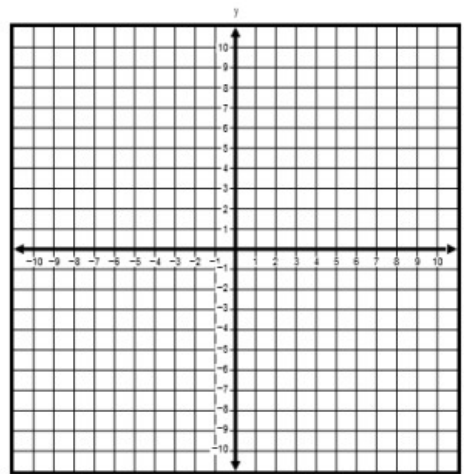
- Angella rewrites the equation in factored form.
- Benjamin rewrites the equation by completing the square.
- Carla evaluates $f(0)$.

Part A

Sketch the graph of the function on the xy -coordinate grid shown.

1. Select the quadratic button.
2. Drag the vertex and another point to graph the function.

Quadratic



Part B

Describe how each student's work contributes to finding the key features of the graph. Complete their work and describe the key feature that is revealed.

Enter your descriptions and your work in the space provided.