

Key

Academic Algebra 2
Unit 6: Quadratic Functions and Inequalities
Pretest

Directions: For problems 1 – 7, select the correct answer and mark the appropriate bubble on your answer sheet. (1 point each)

$$f(1) = 5(1)^2 + 9(1) - 10 = 5 + 9 - 10 = 4$$

1. If $f(x) = 5x^2 + 9x - 10$, what is the value of $f(1)$?

A. 4

B. 5

C. 24

D. -10

2. Solve $x^2 - 16 = 0$.

$$x^2 = 16$$

$$\sqrt{x^2} = \sqrt{16}$$

$$x = \pm 4$$

A. $x = 16$

B. $x = \pm 8$

C. $x = 4$

D. $x = \pm 4$

3. Find the solution to $(x - 2)(x + 1) = 0$.

$$x - 2 = 0$$

$$x = 2$$

$$x + 1 = 0$$

$$x = -1$$

A. (-2, 1)

B. (-2, -6)

C. (2, 1)

D. (2, -1)

4. Solve the following using square roots: $(x + 9)^2 + 10 = 46$.

$$\begin{aligned} (x + 9)^2 + 10 &= 46 \\ -10 &-10 \\ \hline (x + 9)^2 &= 36 \end{aligned}$$

$$\sqrt{(x + 9)^2} = \sqrt{36}$$

$$x + 9 = \pm 6$$

D. 3, 15

$$\begin{aligned} x + 9 &= 6 \\ -9 &-9 \\ \hline x &= -3 \end{aligned}$$

A. 15, -25

B. 15, -15

C. -3, -15

$$\begin{aligned} x + 9 &= -6 \\ -9 &-9 \\ \hline x &= -15 \end{aligned}$$

5. Factor and solve $3x^2 + 7x - 6 = 0$.

$$(3x - 2)(x + 3) = 0$$

$$3x - 2 = 0$$

$$x = \frac{2}{3}$$

$$x + 3 = 0$$

$$x = -3$$

A. $\frac{2}{3}, -3$

B. $-\frac{2}{3}, 3$

C. 2, $-\frac{1}{3}$

D. $\frac{2}{3}, \frac{1}{3}$

6. Identify the a, b, and c for the quadratic equation: $x^2 - 25 = 0$.

$$x^2 + 0x - 25 = 0$$

A. $a = 0, b = 0, c = -25$

B. $a = 1, b = 0, c = -25$

So $a = 1, b = 0, c = -25$

C. $a = 1, b = -25, c = 0$

D. $a = 0, b = 0, c = -25$

7. Find the answer of $5 \pm \sqrt{9 - 4(1)(-10)}$

$$5 \pm \sqrt{9 + 40}$$

A. $5 + \sqrt{31}$

B. 12, -2

$$5 \pm \sqrt{49}$$

C. 12, -12

C. 2, -2

$$5 \pm 7$$

$$5 + 7 \quad \text{or} \quad 5 - 7$$

$$12 \quad \text{or} \quad -2$$

Student Produced Response

Directions: For questions 8 - 9, write your answer in the space provided on your answer sheet. (2 points each)

8. Solve the equation using square roots: $7(x-4)^2 + 2 = 65$

$$\begin{array}{l}
 x-4=3 \quad x-4=-3 \\
 +4 \quad +4 \quad +4 \quad +4 \\
 \hline
 x=7 \quad x=1
 \end{array}$$

$$\begin{array}{r}
 -2 \quad -2 \\
 \hline
 7(x-4)^2 = 63 \\
 \hline
 \sqrt{7(x-4)^2} = \sqrt{63} \\
 \sqrt{7(x-4)^2} = \sqrt{9} \\
 x-4 = \pm 3
 \end{array}$$

9. Solve $x^2 + 7x + 12 = 0$ using factoring. Use mathematics to explain your answer. Use words, symbols or both in your explanation.

$$\begin{array}{l}
 x^2 + 7x + 12 = 0 \\
 (x+4)(x+3) = 0 \\
 x+4=0 \quad x+3=0 \\
 \boxed{x=-4} \quad \boxed{x=-3}
 \end{array}$$

10. Solve the equation: $14(x+5) - 5(6x+3) = 18 + 9^0 + 11 - 20x$

$$\begin{array}{r}
 14x + 70 - 30x - 15 = 18 + 1 + 11 - 20x \\
 -16x + 55 = 30 - 20x \\
 +20x \quad -55 \quad -55 + 20x \\
 \hline
 4x = -25 \\
 \frac{4x}{4} = \frac{-25}{4} \\
 x = -\frac{25}{4}
 \end{array}$$

11. Given $2x^2 - 5x + 1 = 0$. Solve the equation using the quadratic formula

$a=2 \quad b=-5 \quad c=1$

$$\begin{array}{l}
 \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \Rightarrow \frac{-(-5) \pm \sqrt{(-5)^2 - 4(2)(1)}}{2(2)} \\
 = \frac{5 \pm \sqrt{25-8}}{4} \\
 = \frac{5 \pm \sqrt{17}}{4}
 \end{array}$$

FINAL ANSWER

$$\boxed{\frac{5 \pm \sqrt{17}}{4}}$$