

(5 points each)

1. The inverse of squaring a number is \_\_\_\_\_.

square root

2. What is the standard form of a quadratic equation?

$$ax^2 + bx + c = 0$$

3. Solve  $x^2 = 16$ .

$$x = \pm 4$$

4. What are the solutions of  $(x + 3)^2 = 49$ ?

$$\begin{aligned} \sqrt{(x+3)^2} &= \sqrt{49} \\ x+3 &= \pm 7 \\ x+3 &= 7 \quad x+3 = -7 \\ -3 \quad -3 \quad -3 \quad -3 \\ \boxed{x = 4 \quad x = -10} \end{aligned}$$

5. Solve  $-2(x - 4)^2 + 3 = -125$

$$\begin{aligned} -2(x-4)^2 + 3 &= -125 \\ -2(x-4)^2 &= -128 \\ -2 \quad -2 \quad -2 \\ \sqrt{(x-4)^2} &= \sqrt{64} \\ x-4 &= \pm 8 \\ x-4 = 8 \quad x-4 = -8 \\ \boxed{x = 12 \quad x = -4} \end{aligned}$$

6. Solve  $4x^2 = 14x + 8$

$$\begin{aligned} 4x^2 - 14x - 8 &= 0 \\ a=4 \quad b=-14 \quad c=-8 \\ x &= \frac{14 \pm \sqrt{324}}{8} \\ x &= \frac{14 \pm 18}{8} \\ \boxed{x = 4 \quad x = -\frac{1}{2}} \end{aligned}$$

7. Which are the solutions of  $x^2 - 2x - 24 = 0$ ?

$$\begin{aligned} (x-6)(x+4) &= 0 \\ x-6 = 0 \quad x+4 = 0 \\ \boxed{x = 6 \quad x = -4} \end{aligned}$$

8. Solve  $x^2 + 10x = 39$ .

$$\begin{aligned} x^2 + 10x - 39 &= 0 \\ (x+13)(x-3) &= 0 \\ x+13 = 0 \quad x-3 = 0 \\ \boxed{x = -13 \quad x = 3} \end{aligned}$$

9. If the discriminant is negative, the equation has \_\_\_\_\_.

no real solutions

10. How many real solutions does the equation below have?

$$9m^2 + 6m + 1 = 0$$

$$\begin{aligned} a=9 \quad b=6 \quad c=1 \\ b^2 - 4ac \\ (6)^2 - 4(9)(1) \\ 36 - 36 \\ 0 \rightarrow \boxed{\text{one real solution}} \end{aligned}$$

11. What values of a, b, and c should be substituted into the quadratic formula to solve  $5x^2 - 3x + 2 = 0$ ?

$$a=5 \quad b=-3 \quad c=2$$

12. Which formula is used to "complete the square"?

$$\left(\frac{b}{2}\right)^2$$

13. What number should be added to both sides of the equation to complete the square on

$$\begin{aligned} x^2 - 6x = 27? \\ \left(\frac{-6}{2}\right)^2 = (-3)^2 = \boxed{9} \end{aligned}$$

$$b=0$$

$$ax^2 + \boxed{bx} + c = 0$$

14. What are the solutions of  $2v^2 + 128 = 0$ ?

$$-128 \quad -128$$

$$\frac{2v^2}{2} = \frac{-128}{2}$$

$$\sqrt{v^2} = \sqrt{-64}$$

No solution

15. If a quadratic equation has two solutions, its graph would cross the x-axis twice.

### WRITTEN RESPONSE (10 pts each)

16. Solve using square roots. 10-2

$$3(x+2)^2 + 4 = 112$$

$$\frac{3(x+2)^2}{3} = \frac{108}{3}$$

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

$$x+2 = \pm 6$$

$$x+2=6 \quad x+2=-6$$

$$-2 \quad -2 \quad -2 \quad -2$$

$$\boxed{x=4 \quad x=-8}$$

17. Solve by completing the square. 10-4b

$$\frac{3x^2}{3} - \frac{12x}{3} = \frac{36}{3}$$

$$x^2 - 4x = 12$$

$$\left(\frac{b}{2}\right)^2 = \left(\frac{-4}{2}\right)^2 = (-2)^2 = 4$$

$$x^2 - 4x + 4 = 12 + 4$$

$$\sqrt{(x-2)^2} = \sqrt{16}$$

$$x-2 = \pm 4$$

$$x-2=4 \quad x-2=-4$$

$$+2 \quad +2 \quad +2 \quad +2$$

$$\boxed{x=6 \quad x=-2}$$

18. Solve using the quadratic formula.

$$-3x^2 + 5x + 2 = 0$$

$$a=-3 \quad b=5 \quad c=2$$

$$b^2 - 4ac$$

$$(5)^2 - 4(-3)(2)$$

$$25 + 24$$

$$49 \rightarrow 2 \text{ real sol}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-5 \pm \sqrt{49}}{-6}$$

$$x = \frac{-5 \pm 7}{-6}$$

$$x = \frac{-5+7}{-6} = \frac{2}{-6} \quad x = \frac{-5-7}{-6} = \frac{-12}{-6}$$

$$\boxed{x = -\frac{1}{3} \quad x = 2}$$