

Unit 8 Test Study Guide

(Quadratic Equations)

Name: Key
 Date: _____ Per: _____

Solve each equation. Simplify all irrational solutions.

21. $x^2 + 4x - 45 = 0$

$a = 1$
 $b = 4$
 $c = -45$

$$\frac{-4 \pm \sqrt{(-4)^2 - 4 \cdot 1 \cdot (-45)}}{2 \cdot 1}$$

$$\frac{-4 \pm \sqrt{16 - (-180)}}{2}$$

$$\frac{-4 \pm \sqrt{196}}{2} = \frac{-4 \pm 14}{2}$$

$$\frac{-4 + 14}{2} \quad \frac{-4 - 14}{2}$$

$x = \{-9, 5\}$

- F
- CS
- SR
- QF

22. $2x^2 - 9 = 39$

$+9 + 9$

$\frac{2x^2}{2} = \frac{48}{2}$

$\sqrt{x^2} = \sqrt{24} = \sqrt{4 \cdot 6}$

$x = \{\pm 2\sqrt{6}\}$

- F
- CS
- SR
- QF

23. $x^2 - 10x - 3 = 0$

$+3 + 3$

$x^2 - 10x = 3$

$x^2 - 10x + 25 = 3 + 25$

$\sqrt{(x-5)^2} = \sqrt{28} = \sqrt{4 \cdot 7}$

$x - 5 = \pm 2\sqrt{7}$

$x = \{5 \pm 2\sqrt{7}\}$

- F
- CS
- SR
- QF

24. $16x^2 = 10x$

$-10x - 10x$

$16x^2 - 10x = 0$

$2x(8x - 5) = 0$

$x = \{0, 5/8\}$

- F
- CS
- SR
- QF

25. $3x^2 - 8x - 8 = 0$

$a = 3$
 $b = -8$
 $c = -8$

$\frac{8 \pm \sqrt{(-8)^2 - 4 \cdot 3 \cdot (-8)}}{2 \cdot 3}$

$\frac{8 \pm \sqrt{64 + 96}}{6}$

$\frac{8 \pm \sqrt{160}}{6} = \frac{\sqrt{16} \cdot \sqrt{10}}{6}$

Divide all by 2 $\rightarrow \frac{8 \pm 4\sqrt{10}}{6}$

$x = \left\{ \frac{4 \pm 2\sqrt{10}}{3} \right\}$

26. $-x^2 + 3x = x - 19$

$-x + 19 - x + 19$

$-x^2 + 2x + 19 = 0$

$\frac{-2 \pm \sqrt{2^2 - 4 \cdot (-1) \cdot 19}}{2 \cdot (-1)}$

$\frac{-2 \pm \sqrt{4 + 76}}{-2}$

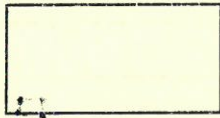
$\frac{-2 \pm \sqrt{80}}{-2} = \frac{\sqrt{16} \cdot \sqrt{5}}{-2}$

$x = \{1 \pm 2\sqrt{5}\}$

$a = -1$
 $b = 2$
 $c = 19$

$\frac{-2 \pm 4\sqrt{5}}{-2}$ \leftarrow Divide all by -2

33. If the area of the rectangle below is 42 inches squared, find the value of x.



$x-3$

$$(x-3)(x+8) = 42$$

$$x^2 + 5x - 24 = 42$$

$$-42 \quad -42$$

$$x^2 + 5x - 66 = 0$$

$$(x+11)(x-6) = 0$$

$$x = 6$$

36. Find two consecutive positive integers such the sum of their squares is 145.

$$\begin{array}{r} x \\ x^2 - 8x \\ \hline 9x - 72 \end{array}$$

1st = x

2nd = x+1

$$(x-8)(x+9) = 0$$

$$x^2 + (x+1)^2 = 145$$

$$x^2 + (x+1)(x+1) = 145$$

$$x^2 + x^2 + 2x + 1 = 145$$

$$2x^2 + 2x + 1 = 145$$

$$2x^2 + 2x - 144 = 0$$

$$2(x^2 + x - 72) = 0$$

8, 9

37. Natalie found a tennis ball outside a tennis court. She picked up the ball and threw it over the fence into the court. The path of the ball can be represented by the equation $h = -16t^2 + 18t + 5$.

a. Find the maximum height of the tennis ball.

$$x = \frac{-b}{2a} \quad x = \frac{-18}{2 \cdot -16} = \frac{-18}{-32} \quad a = -16$$

$$b = 18$$

$$x = 0.56 \quad c = 5$$

$$h = -16(0.56)^2 + 18(0.56) + 5$$

$$-5.02 + 10.08 + 5$$

$$h = 10.06 \text{ ft}$$

b. How long will it take to reach the ground?

$$\frac{-18 \pm \sqrt{(18)^2 - 4 \cdot -16 \cdot 5}}{2 \cdot -16}$$

$$\frac{-18 \pm \sqrt{324 + 1320}}{-32}$$

$$\frac{-18 \pm \sqrt{644} \approx 25.38}{-32}$$

$$\frac{-18 + 25.38}{-32}, \frac{-18 - 25.38}{-32}$$

$$-0.23, \boxed{1.36 \text{ s}}$$

positive answer