

## Solving Quadratics

## Unit 2 Test Review

## Factoring

1)  $3b^2 - 12$

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

$$3(b+2)(b-2)$$

2)  $x^3 - x^2 - 9x + 9$

$$x^2(x-1) - 9(x-1)$$

$$(x-1)(x^2 - 9)$$

$$(x-1)(x+3)(x-3)$$

3)  $16m^2 - 24m + 9$

$$(4m-3)(4m-3)$$

## Solve by Factoring

4)  $6r^2 - 12r = 0$

$$\frac{6}{6} \quad \frac{6}{6}$$

$$r^2 - 2r = 0$$

$$r(r-2) = 0$$

$$r=0 \quad r=2$$

5)  $2y^2 - 11y + 5 = 0$

$$(2y-1)(y-5) = 0$$

$$y = \frac{1}{2} \quad y = 5$$

6)  $10x^2 - 35 = 65x$

$$\frac{10x^2}{5} - \frac{35}{5} = \frac{65x}{5}$$

$$2x^2 - 13x - 7 = 0$$

$$(2x+1)(x-7) = 0$$

$$x = -\frac{1}{2} \quad x = 7$$

## Solve by using square roots

7)  $-3m^2 = 27$

$$\frac{-3m^2}{-3} = \frac{27}{-3}$$

$$m^2 = -9$$

$$m = \pm 3i$$

8)  $(x-2)^2 = 12$

$$x-2 = \pm \sqrt{12}$$

$$x = 2 \pm 2\sqrt{3}$$

9)  $-8 - 8p^2 = -31$

$$-8p^2 = -23$$

$$p^2 = \frac{23}{8}$$

$$p = \pm \sqrt{\frac{23}{8}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \pm \frac{\sqrt{46}}{4}$$

## Solve by completing the square

10)  $x^2 + 6x + 3 = 0$

$$x^2 + 6x + 9 = -3 + 9$$

$$(x+3)^2 = 6$$

$$x = -3 \pm \sqrt{6}$$

11)  $2x^2 + 4x + 10 = 0$

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

$$x^2 + 2x + 1 = -5 + 1$$

$$(x+1)^2 = -4$$

$$x = -1 \pm 2i$$

12)  $-6x^2 - 6 = -12x - 9$

$$-6x^2 + 12x + 3 = 0$$

$$x^2 - 2x + 1 = \frac{1}{2} + \frac{2}{2}$$

$$(x-1)^2 = \frac{3}{2}$$

$$x = 1 \pm \sqrt{\frac{3}{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = 1 \pm \frac{\sqrt{6}}{2}$$

## Solve by using the quadratic formula

13)  $x^2 + 4x + 2 = 0$

$$x = \frac{-4 \pm \sqrt{8}}{2}$$

$$x = \frac{-4 \pm 2\sqrt{2}}{2}$$

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

14)  $2x^2 - 3x = -5$

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

$$x = \frac{3 \pm \sqrt{-31}}{4}$$

$$x = \frac{3 \pm i\sqrt{31}}{4}$$

15)  $2x^2 - x - 4 = 2$

$$2x^2 - x - 6 = 0$$

$$x = \frac{1 \pm \sqrt{49}}{4}$$

$$x = \frac{1 \pm 7}{4}$$

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

Solve using any method

16)  $5x^2 + 9 = 14$

$5x^2 = 5$

$x^2 = 1$

$x = \pm 1$

17)  $2x^2 - x - 13 = 2$

$2x^2 - x - 15 = 0$

$(2x + 5)(x - 3) = 0$

$x = -\frac{5}{2} \quad x = 3$

18)  $2x^2 - 1 = 8$

$2x^2 = 9$

$x^2 = \frac{9}{2}$

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

Find the discriminant and describe the nature of the roots.

19)  $4x^2 = 8x - 4$

$4x^2 - 8x + 4 = 0$

$x^2 - 2x + 1 = 0$

$b^2 - 4ac = 0$

one real rational

20)  $9x^2 - 3x - 8 = -10$

$9x^2 - 3x + 2 = 0$

$b^2 - 4ac = -63$

two complex

21)  $-6x^2 - 6 = -7x - 9$

$-6x^2 + 7x + 3 = 0$

$6x^2 - 7x - 3 = 0$

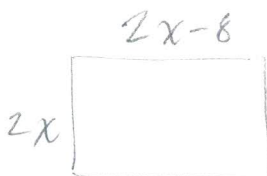
$b^2 - 4ac = 121$

two real rational

Modeling using quadratics

22) A contractor is pouring a rectangular concrete floor for a garage. The area of the floor is 560 square feet. The dimensions of the floor are  $(2x)$  and  $(2x - 8)$ . All measurements are in feet.

a. Write a quadratic equation that represents the area of the floor.



$2x(2x - 8) = 560$

$4x^2 - 16x - 560 = 0$

$x^2 - 4x - 140 = 0$

b. Solve the quadratic equation using any algebraic method.

$(x - 14)(x + 10) = 0$

$x = 14 \quad x = -10$

c. What are the dimensions of the garage floor?

$2x \rightarrow 28 \text{ ft.}$

$2x - 8 \rightarrow 20 \text{ ft.}$

$28 \text{ ft} \times 20 \text{ ft}$