

## Quadratic Equations Quest Review

Date \_\_\_\_\_ Period \_\_\_\_\_

**Factor each completely.**

1)  $4n^2 + 28n + 40$

2)  $-m^3 + 9m$

3)  $125p^2 - 80$

4)  $2x^2 + 9x + 9$

5)  $-6x^2 + 28x - 32$

6)  $16r^4 - 9$

7)  $9m^2 + 74m + 16$

8)  $8v^2 + 26v + 15$

**Solve each equation by factoring.**

9)  $x^2 + x - 30 = 0$

10)  $a^2 + 8a + 7 = 0$

11)  $p^2 + 4p + 3 = 0$

12)  $x^2 + 10x + 25 = 0$

13)  $14x^2 + 15x - 9 = 0$

14)  $7r^2 + 6r - 16 = 0$

15)  $2b^2 - b = 0$

16)  $7n^2 + 53n + 28 = 0$

**Solve each equation by taking square roots.**

17)  $2m^2 - 6 = 12$

18)  $25x^2 - 2 = 62$

19)  $3x^2 - 7 = 65$

20)  $7x^2 - 5 = 506$

21)  $n^2 + 9 = -1$

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

**Solve each equation with the quadratic formula.**

23)  $4k^2 + 5k - 44 = 0$

24)  $4x^2 + 8x + 4 = 0$

25)  $5a^2 + 4a - 2 = -7$

26)  $4x^2 + 8x + 1 = 4$

27)  $5a^2 = 7a + 10$

28)  $n^2 + 7 = 4n$

**Find the discriminant of each quadratic equation then state the number and type of solutions.**

29)  $4r^2 - 2r = 0$

30)  $-4k^2 + 4k - 1 = 0$

31)  $-4x^2 + 3x - 1 = 5$

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

33)  $-3r^2 = 4 - 3r$

34)  $5n^2 - 4n = -1$

**A projectile is shot from a platform on Mars, where the gravity is less than here on the Earth. Its height  $h$  in feet, can be calculated with the equation  $h = -3t^2 + 6t + 45$  where  $t$  represents time in seconds after it was shot.**

35) How high was the platform the projectile was shot from?

36) How long will it take to hit the ground?

37) How high will the projectile be after 3 seconds?

38) When will it reach its highest point?

39) What is the highest that the projectile will get?

40) When will it be 21 feet from the ground?

## Quadratic Equations Quest Review

Date \_\_\_\_\_ Period \_\_\_\_\_

**Factor each completely.**

1)  $4n^2 + 28n + 40$

$4(n+2)(n+5)$

2)  $-m^3 + 9m$

$-m(m-3)(m+3)$

3)  $125p^2 - 80$

$5(5p+4)(5p-4)$

4)  $2x^2 + 9x + 9$

$(2x+3)(x+3)$

5)  $-6x^2 + 28x - 32$

$-2(3x-8)(x-2)$

6)  $16r^4 - 9$

$(4r^2+3)(4r^2-3)$

7)  $9m^2 + 74m + 16$

$(m+8)(9m+2)$

8)  $8v^2 + 26v + 15$

$(2v+5)(4v+3)$

**Solve each equation by factoring.**

9)  $x^2 + x - 30 = 0$

$\{5, -6\}$

10)  $a^2 + 8a + 7 = 0$

$\{-7, -1\}$

11)  $p^2 + 4p + 3 = 0$

$\{-3, -1\}$

12)  $x^2 + 10x + 25 = 0$

$\{-5\}$

13)  $14x^2 + 15x - 9 = 0$

$\left\{-\frac{3}{2}, \frac{3}{7}\right\}$

14)  $7r^2 + 6r - 16 = 0$

$\left\{\frac{8}{7}, -2\right\}$

15)  $2b^2 - b = 0$

$\left\{\frac{1}{2}, 0\right\}$

16)  $7n^2 + 53n + 28 = 0$

$\left\{-\frac{4}{7}, -7\right\}$

**Solve each equation by taking square roots.**

17)  $2m^2 - 6 = 12$

$\{3, -3\}$

18)  $25x^2 - 2 = 62$

$\left\{\frac{8}{5}, -\frac{8}{5}\right\}$

19)  $3x^2 - 7 = 65$

$\{2\sqrt{6}, -2\sqrt{6}\}$

20)  $7x^2 - 5 = 506$

$\{\sqrt{73}, -\sqrt{73}\}$

21)  $n^2 + 9 = -1$

$\{i\sqrt{10}, -i\sqrt{10}\}$

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

$\{2i\sqrt{2}, -2i\sqrt{2}\}$

**Solve each equation with the quadratic formula.**

23)  $4k^2 + 5k - 44 = 0$

$$\left\{ \frac{11}{4}, -4 \right\}$$

25)  $5a^2 + 4a - 2 = -7$

$$\left\{ \frac{-2 + i\sqrt{21}}{5}, \frac{-2 - i\sqrt{21}}{5} \right\}$$

27)  $5a^2 = 7a + 10$

$$\left\{ \frac{7 + \sqrt{249}}{10}, \frac{7 - \sqrt{249}}{10} \right\}$$

24)  $4x^2 + 8x + 4 = 0$

$$\{-1\}$$

26)  $4x^2 + 8x + 1 = 4$

$$\left\{ \frac{-2 + \sqrt{7}}{2}, \frac{-2 - \sqrt{7}}{2} \right\}$$

28)  $n^2 + 7 = 4n$

$$\{2 + i\sqrt{3}, 2 - i\sqrt{3}\}$$

**Find the discriminant of each quadratic equation then state the number and type of solutions.**

29)  $4r^2 - 2r = 0$

4; two real solutions

30)  $-4k^2 + 4k - 1 = 0$

0; one real solution

31)  $-4x^2 + 3x - 1 = 5$

-87; two imaginary solutions

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

25; two real solutions

33)  $-3r^2 = 4 - 3r$

-39; two imaginary solutions

34)  $5n^2 - 4n = -1$

-4; two imaginary solutions

**A projectile is shot from a platform on Mars, where the gravity is less than here on the Earth. Its height  $h$  in feet, can be calculated with the equation  $h = -3t^2 + 6t + 45$  where  $t$  represents time in seconds after it was shot.**

35) How high was the platform the projectile was shot from?

45 feet

36) How long will it take to hit the ground?

5 seconds

37) How high will the projectile be after 3 seconds?

36 feet

38) When will it reach its highest point?

1 second

39) What is the highest that the projectile will get?

48 feet

40) When will it be 21 feet from the ground?

4 seconds