

Final Review #2 - Solving Quadratics (Unit 9A)

1) Given $g(x) = 3x + 2$ and $h(x) = (x - 2)^2$, which statement is true?

- A) $h(-1) > g(4)$ B) $h(3) > g(3)$
 C) $g(3) > h(3)$ D) $g(-1) > h(1)$
- $g(4) = 3(4) + 2 = 14$ $g(3) = 3(3) + 2 = 11$
 $h(-1) = (-1-2)^2 = (-3)^2 = 9$ $h(3) = (3-2)^2 = 1$

2) Given $g(x) = x^2 + 1$ and $h(x) = (x + 1)^2$, which statement is true?

- A) $h(1) > g(3)$ $4 > 10$ B) $h(-3) > g(-3)$ $4 > 10$
 C) $g(-2) > h(2)$ $5 > 9$ D) $g(-1) > h(-2)$ $2 > 1$
- $g(-2) = (-2)^2 + 1 = 4 + 1 = 5$

3) Which function makes this true:

- $f(2) > f(-3)$
- A) $f(x) = x^2 - 3$ $f(2) = 1$ $f(-3) = 6$
 B) $f(x) = -5x - 2$ $f(2) = -12$ $f(-3) = 13$
 C) $f(x) = (x - 2)^2$ $f(2) = 0$ $f(-3) = 25$
 D) $f(x) = 2x - 1$ $f(2) = 3$ $f(-3) = -7$ ✓

4) Which function makes this true:

- $f(-4) > f(3)$
- A) $f(x) = 3x - 4$ $f(-4) = -16$ $f(3) = 5$
 B) $f(x) = x^2 + 5$ $f(-4) = 21$ $f(3) = 14$ ✓
 C) $f(x) = (x + 3)^2$ $f(-4) = 1$ $f(3) = 36$
 D) $f(x) = (x + 1)^2$ $f(-4) = 9$ $f(3) = 16$

Solve each equation by factoring.

5) $x^2 - 5x - 14 = 0$

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

$x = 7$ $x = -2$

6) $p^2 + 11p + 28 = 0$

$(p + 7)(p + 4) = 0$

$p = -7$ $p = -4$

7) $3r^2 - 21r + 35 = 5$

$3r^2 - 21r + 30 = 0$

$3(r^2 - 7r + 10) = 0$

$3(r - 5)(r - 2) = 0$

$r = 5$
 $r = 2$

8) $r^2 - 10r + 21 = 5$

$r^2 - 10r + 16 = 0$

$(r - 8)(r - 2) = 0$

$r = 8$
 $r = 2$

9) $x^2 + 8x = 7x + 20$

$x^2 + 1x - 20 = 0$

$(x + 5)(x - 4) = 0$

$x = -5$
 $x = 4$

10) $10k^2 + 45 = 7k^2 + 24k$

$3k^2 - 24k + 45 = 0$

$3(k^2 - 8k + 15) = 0$

$3(k - 5)(k - 3) = 0$

$k = 5$
 $k = 3$

What value of x makes the equation true?

11) $5x^2 + 90 = -45x$

$5x^2 + 45x + 90 = 0$

$5(x^2 + 9x + 18) = 0$

$5(x + 6)(x + 3) = 0$

$x = -6$
 $x = -3$

12) $x^2 = 42 - x$

$x^2 + x - 42 = 0$

$(x + 7)(x - 6) = 0$

$x = -7$
 $x = 6$

Solve each equation by taking square roots.

13) $2m^2 = 128$

$$\frac{2m^2}{2} = \frac{128}{2}$$

$$\sqrt{m^2} = \sqrt{64}$$

$$m = \pm 8$$

14) $3x^2 = 147$

$$\frac{3x^2}{3} = \frac{147}{3}$$

$$\sqrt{x^2} = \sqrt{49}$$

$$x = \pm 7$$

15) $x^2 - 4 = 77$

$$x^2 - 4 + 4 = 77 + 4$$

$$\sqrt{x^2} = \sqrt{81}$$

$$x = \pm 9$$

16) $2m^2 - 8 = 90$

$$\frac{2m^2 - 8}{2} = \frac{90}{2}$$

$$\frac{2m^2}{2} = \frac{98}{2}$$

$$\sqrt{m^2} = \sqrt{49}$$

$$m = 7, -7$$

17) $2n^2 - 5 = 59$

$$\frac{2n^2 - 5}{2} = \frac{59}{2}$$

$$\frac{2n^2}{2} = \frac{123}{2}$$

$$\sqrt{n^2} = \sqrt{32}$$

$$n = \pm 4\sqrt{2}$$

18) $2n^2 + 10 = 12$

$$\frac{2n^2 + 10}{2} = \frac{12}{2}$$

$$\frac{2n^2}{2} = \frac{2}{2}$$

$$\sqrt{n^2} = \sqrt{1}$$

$$n = \pm 1$$

Solve each equation with the quadratic formula.

19) $2x^2 + 7x - 60 = 0$

$$x = \frac{-7 \pm \sqrt{7^2 - 4(2)(-60)}}{2(2)}$$

$$= \frac{-7 \pm \sqrt{49 + 480}}{4}$$

$$= \frac{-7 \pm \sqrt{529}}{4} = \frac{-7 \pm 23}{4}$$

$$\begin{cases} \frac{-7 + 23}{4} = 4 \\ \frac{-7 - 23}{4} = \frac{-30}{4} = \frac{-15}{2} \end{cases}$$

21) $12x^2 - 4x - 18 = 0$

$$x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(12)(-18)}}{2(12)}$$

$$= \frac{4 \pm \sqrt{16 + 864}}{24}$$

$$= \frac{4 \pm \sqrt{880}}{24} = \frac{4 \pm 4\sqrt{55}}{24} = \frac{1 \pm \sqrt{55}}{6}$$

20) $6a^2 - 3a + 9 = 0$

$$x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(6)(9)}}{2(6)}$$

$$= \frac{3 \pm \sqrt{9 - 216}}{12}$$

$$= \frac{3 \pm \sqrt{-207}}{12}$$

No Solution

22) $x^2 - 10x + 11 = 0$

$$x = \frac{-(-10) \pm \sqrt{(-10)^2 - 4(1)(11)}}{2(1)}$$

$$= \frac{10 \pm \sqrt{100 - 44}}{2}$$

$$= \frac{10 \pm \sqrt{56}}{2} = \frac{10 \pm 2\sqrt{14}}{2} = 5 \pm \sqrt{14}$$