

Final Review #4

Adding and Subtracting Radicals

Perfect Squares- 1, 4, 9, 16, 25, 36, 49, 64, 81, 100

Simplify:

$$1) \sqrt{72}$$

$$\sqrt{36} \sqrt{2}$$

$$6\sqrt{2}$$

$$2) \sqrt{175}$$

$$\sqrt{25} \sqrt{7}$$

$$5\sqrt{7}$$

$$3) -2\sqrt{3} + 3\sqrt{27}$$

$$\sqrt{9} \sqrt{3}$$

$$-2\sqrt{3} + 9\sqrt{3}$$

$$7\sqrt{3}$$

$$4) 2\sqrt{6} - 2\sqrt{24}$$

$$\sqrt{4} \sqrt{6}$$

$$2\sqrt{6} - 4\sqrt{6}$$

$$-2\sqrt{6}$$

$$5) -3\sqrt{18} + 3\sqrt{8} - \sqrt{24}$$

$$\sqrt{9} \sqrt{2} \quad \sqrt{4} \sqrt{2} \quad \sqrt{4} \sqrt{6}$$

$$-9\sqrt{2} + 6\sqrt{2} - 2\sqrt{6}$$

$$-3\sqrt{2} - 2\sqrt{6}$$

$$6) 3\sqrt{18} + 3\sqrt{12} + 2\sqrt{27}$$

$$\sqrt{9} \sqrt{2} \quad \sqrt{4} \sqrt{3} \quad \sqrt{9} \sqrt{3}$$

$$9\sqrt{2} + 6\sqrt{3} + 6\sqrt{3}$$

$$9\sqrt{2} + 12\sqrt{3}$$

$$7) -2\sqrt{20} + 2\sqrt{18} - 2\sqrt{5}$$

$$\sqrt{4} \sqrt{5} \quad \sqrt{9} \sqrt{2}$$

$$-4\sqrt{5} + 6\sqrt{2} - 2\sqrt{5}$$

$$2\sqrt{2} - 2\sqrt{5}$$

$$8) -\sqrt{45} + 2\sqrt{5} - \sqrt{20} - 2\sqrt{6}$$

$$\sqrt{9} \sqrt{5} \quad \sqrt{4} \sqrt{5}$$

$$-3\sqrt{5} + 2\sqrt{5} - 2\sqrt{5} - 2\sqrt{6}$$

$$-3\sqrt{5} - 2\sqrt{6}$$

## Completing the Square

Directions: Solve for x by completing the square.

9)  $x^2 - 4x - 12 = 0$

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

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

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

$$x-2 = \pm 4$$

$$\begin{array}{l} x-2=4 \\ +2 \quad +2 \\ \hline x=6 \end{array} \quad \begin{array}{l} x-2=-4 \\ +2 \quad +2 \\ \hline x=-2 \end{array}$$

11)  $x^2 + 14x - 51 = 0$

$$x^2 + 14x = 51$$

$$(x+7)^2 = 51 + 49$$

$$\sqrt{(x+7)^2} = \sqrt{100}$$

$$x+7 = \pm 10$$

$$\begin{array}{l} x+7=10 \\ \hline x=3 \end{array} \quad \begin{array}{l} x+7=-10 \\ \hline x=-17 \end{array}$$

13)  $x^2 + 14x - 38 = 0$

$$x^2 + 14x = 38$$

$$\sqrt{(x+7)^2} = \sqrt{87}$$

$$x+7 = \pm \sqrt{87}$$

$$x = -7 \pm \sqrt{87}$$

10)  $x^2 + 6x - 59 = 0$

$$x^2 + 6x = 59$$

$$(x+3)^2 = 59 + 9$$

$$\sqrt{(x+3)^2} = \sqrt{68}$$

$$x+3 = \pm \sqrt{68}$$

$$x+3 = \pm 2\sqrt{17}$$

$$x = -3 \pm 2\sqrt{17}$$

12)  $x^2 - 12x + 23 = 0$

$$x^2 - 12x = -23$$

$$\sqrt{(x-6)^2} = \sqrt{13}$$

$$x-6 = \sqrt{13}$$

$$x = 6 \pm \sqrt{13}$$

14)  $x^2 - 12x + 11 = 0$

$$x^2 - 12x = -11$$

$$\sqrt{(x-6)^2} = \sqrt{25}$$

$$x-6 = \pm 5$$

$$x-6=5 \quad x-6=-5$$

$$x=11$$

$$x=1$$

## Solve by Factoring

Directions: Solve the following by factoring.

15)  $x^2 - 21x + 20 = 0$

$$(x-20)(x-1) = 0$$

$$x=20 \quad x=1$$

16)  $x^2 + 6x + 8 = 0$

$$(x+4)(x+2) = 0$$

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

## Quadratic Formula

Directions: Solve for the roots of the equation by using the quadratic formula.

17)  $2x^2 - 3x - 5 = 0$

$$x = \frac{3 \pm \sqrt{(-3)^2 - 4(2)(-5)}}{2(2)}$$

$$x = \frac{3 \pm \sqrt{49}}{4} = \frac{3 \pm 7}{4}$$

$$\frac{3+7}{4} = \frac{10}{4} = \frac{5}{2} \quad \frac{3-7}{4} = \frac{-4}{4} = -1$$

19)  $9x^2 - 7x - 4 = 0$

$$x = \frac{7 \pm \sqrt{(-7)^2 - 4(9)(-4)}}{2(9)}$$

$$x = \frac{7 \pm \sqrt{193}}{18}$$

21)  $9x^2 - 6x - 11 = 0$

$$x = \frac{6 \pm \sqrt{(-6)^2 - 4(9)(-11)}}{2(9)}$$

$$x = \frac{6 \pm \sqrt{432}}{18}$$

$$\frac{6 \pm 12\sqrt{3}}{18} = \frac{1 \pm 2\sqrt{3}}{3}$$

18)  $2x^2 - 7x - 3 = 0$

$$x = \frac{7 \pm \sqrt{(-7)^2 - 4(2)(-3)}}{2(2)}$$

$$x = \frac{7 \pm \sqrt{73}}{4}$$

20)  $8x^2 - 4x - 18 = 0$

$$x = \frac{4 \pm \sqrt{(-4)^2 - 4(8)(-18)}}{2(8)}$$

$$x = \frac{4 \pm \sqrt{592}}{16}$$

$$\frac{4 \pm 4\sqrt{37}}{16}$$

$$\frac{1 \pm \sqrt{37}}{4}$$

22)  $4x^2 + 4x - 9 = 0$

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

$$x = \frac{-4 \pm \sqrt{160}}{8}$$

$$\frac{-4 \pm 4\sqrt{10}}{8}$$

$$\frac{-1 \pm \sqrt{10}}{2}$$