

Solve each equation by factoring, and state all real solutions.

1.) $k^2 + 24 = -11k$

$$x^2 + 11x + 24 = 0$$

$$(x+8)(x+3) = 0$$

$$x = -8 \quad x = -3$$

Solutions: _____

$$x = -8, -3$$

3.) $81n^2 - 16 = 0$

$$(9n-4)(9n+4) = 0$$

$$n = 4/9 \quad n = -4/9$$

Solutions: _____

2.) $2x^3 + 8x^2 - 3x - 12 = 0$

$$2x(x+4) - 3(x+4) = 0$$

$$(2x^2 - 3)(x+4) = 0$$

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

$$2x^2 = 3$$

$$x^2 = 3/2$$

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

$$\pm 1.2$$

$$x = -4$$

Solutions: _____

4.) $6x^4 - 9x^3 - 42x^2 = 0$

$$3x^2(2x^2 - 3x - 14) = 0$$

$$2x^2 + 4x - 7x - 14$$

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

$$3x^2(x+2)(2x-7)$$

$$3x^2 = 0 \quad x+2 = 0 \quad 2x-7 = 0$$

$$x = 0 \quad x = -2 \quad x = 7/2$$

$$x = 0$$

Solutions: _____

$$0, 0, -2, 7/2$$

$$5.) 6x^3 - 22x^2 + 12x = 0$$

$$\begin{array}{r} 18 \\ -9 \quad -2 \\ \hline -11 \end{array}$$

$$2x(3x^2 - 11x + 6) = 0$$

$$\begin{array}{l} 3x^2 - 9x - 2x + 6 \\ 3x(x-3) - 2(x-3) \end{array}$$

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

$$x=0 \quad x=3 \quad x=\frac{2}{3}$$

(0,7)

Solutions: _____

$$6.) 6x^2 - 5x + 1 = 0$$

$$\begin{array}{r} 6 \\ -2 \quad -3 \\ \hline -5 \end{array}$$

$$\begin{array}{l} 6x^2 - 2x - 3x + 1 \\ 2x(3x-1) - 1(3x-1) \end{array}$$

$$(3x-1)(2x-1) = 0$$

$$x = \frac{1}{3} \quad x = \frac{1}{2}$$

(1,3) (1,5)

Solutions: _____

$$7.) 5y^2 - 12y - 12 = -10y^2 - 40y + 20$$

$$\begin{array}{r} -480 \\ 40 \quad -12 \\ \hline 28 \end{array}$$

$$15y^2 + 28y - 32 = 0$$

$$15y^2 + 40y - 12y - 32$$

$$5y(3y+8) - 4(3y+8)$$

$$(5y-4)(3y+8) = 0$$

$$y = \frac{4}{5} \quad y = -\frac{8}{3}$$

-8 -2,7

Solutions: _____

$$8.) 2x^3 - 10x = 20 - 4x^2$$

$$2x^3 + 4x^2 - 10x - 20 = 0$$

$$\begin{array}{l} 2(x^3 + 2x^2 - 5x - 10) \\ x^2(x+2) - 5(x+2) \end{array}$$

$$2(x+2)(x^2-5)$$

$$x+2=0 \quad x^2-5=0$$

$$x = -2$$

$$x^2 = 5$$

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

$$\pm 2,2$$

Solutions: $-2, 2, 2, 2$