

Algebra 2

Name _____

6.1G Solve by Factoring (with Delta Math)

Date _____ Period _____

Solve each equation for all values of x . You must show work.

1) $x(x^2 - 13)(x^2 + 25) = 0$

2) $2x(9x + 4)(x^2 - 64) = 0$

$$\begin{array}{ccc} \swarrow & \downarrow & \searrow \\ \boxed{x=0} & x^2 - 13 = 0 & x^2 + 25 = 0 \\ & \begin{array}{c} +13 \quad +13 \\ \sqrt{x^2} = \sqrt{13} \end{array} & \begin{array}{c} -25 \quad -25 \\ \sqrt{x^2} = \sqrt{-25} \end{array} \\ & \boxed{x = \pm\sqrt{13}} & \boxed{x = \pm 5i} \end{array}$$

$$\boxed{0}, \boxed{\pm\sqrt{13}}, \boxed{\pm 5i}$$

3) $-2(5x + 8)(x^2 - 13) = 0$

4) $2x(x^2 - 49)(100x^2 - 81) = 0$

$$\begin{array}{ccc} \swarrow & \downarrow & \searrow \\ \cancel{-2=0} & 5x + 8 = 0 & x^2 - 13 = 0 \\ & \begin{array}{c} -8 \quad -8 \\ \frac{5x}{5} = \frac{-8}{5} \end{array} & \begin{array}{c} +13 \quad +13 \\ \sqrt{x^2} = \sqrt{13} \end{array} \\ & x = \frac{-8}{5} & x = \pm\sqrt{13} \\ & \boxed{\frac{-8}{5}}, \boxed{\pm\sqrt{13}} & \end{array}$$

5) $(x - 3)(x^2 + 9) = 0$

6) $-3x(x^2 - 14)(x^2 + 16) = 0$

$$\bullet \quad 7) \quad \frac{3x^4 + 2x^3}{x^3} = 0$$

$$8) \quad 4x^4 - 4 = 0$$

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

$$\frac{-x^3}{-1} = \frac{0}{-1}$$

$$\sqrt[3]{x^3} = \sqrt[3]{0}$$

$$x = 0$$

$$3x - 2 = 0$$

$$+2 \quad +2$$

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

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

$$9) \quad -2x^4 + 32 = 0$$

$$10) \quad -x^4 + 3x^2 = 0$$

$$11) \quad 2x^2 + 3x = 0$$

$$\bullet \quad 12) \quad \frac{x^7 - 81x^3}{x^3} = 0$$

$$x^3(x^4 - 81) = 0$$

$$\sqrt{x^4} = x^2 \quad \sqrt{81} = 9$$

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

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

$$x^3 = 0$$

$$x = 0$$

$$x-3=0$$

$$+3 \quad +3$$

$$x = 3$$

$$x+3=0$$

$$-3 \quad -3$$

$$x = -3$$

$$x^2+9=0$$

$$\sqrt{-9} \quad \sqrt{-9}$$

$$\sqrt{x^2} = \sqrt{-9}$$

$$x = \pm 3i$$

$$\boxed{0}, \quad \boxed{3}, \quad \boxed{-3}, \quad \boxed{\pm 3i}$$

or

$$\boxed{0}, \quad \boxed{\pm 3}, \quad \boxed{\pm 3i}$$