

# Review #3: Solving Equations

Score: \_\_\_\_\_ /11

Group Members: \_\_\_\_\_

Hint from teacher

Ask another group

Look in Notes

Solve by factoring.

1.  $3x^2 + 11x + 6 = 0$

$$\frac{3x^2 + 2x + 9x + 6}{x \quad 3} = 0$$

$\frac{18}{1 \ 18}$   
 $+2+9$   
 $3 \ 6$

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

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

$$3x+2=0 \quad x+3=0$$

$$\boxed{x = -\frac{2}{3}} \quad \boxed{x = -3}$$

2.  $2x^3 - 5x^2 + 3x = 0$

$$\frac{2x^3 - 5x^2 + 3x}{x} = 0$$

$\frac{6}{1 \ 6}$   
 $-2-3$

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

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

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

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

$$\boxed{x = 0 \quad x = 1 \quad x = \frac{3}{2}}$$

3.  $9x^3 - 4x = 0$

$$\frac{9x^3 - 4x}{x} = 0$$

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

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

$\boxed{x = 0}$      $3x-2=0$      $3x+2=0$   
 $\boxed{x = \frac{2}{3}}$      $\boxed{x = -\frac{2}{3}}$

4. Solve using the square roots method.

$$\frac{3}{1} \cdot \left[ \frac{1}{3}(x+2)^2 \right] = \left( \frac{3}{4} \right) \cdot \frac{3}{1}$$

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

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

$-2 \quad -2$

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

$$x = -2 + \frac{3}{2}, \quad -2 - \frac{3}{2}$$

$$x = -\frac{4}{2} + \frac{3}{2}, \quad -\frac{4}{2} - \frac{3}{2}$$

$$\boxed{x = -\frac{1}{2}, -\frac{7}{2}}$$

5. Solve by completing the square.

$$x^2 - 4x + 8 = 0$$

$$\frac{-8 \quad -8}{x^2 - 4x = -8}$$

$$x^2 - 4x + 4 = -8 + 4$$

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

$$x-2 = \pm 2i$$

$+2 \quad +2$

$$\boxed{x = 2 \pm 2i}$$

SOLVE the equation. Discard any extraneous roots, if necessary.

6. Solve using the quadratic formula.

$$4x^2 - 2x = 3$$

$$4x^2 - 2x - 3 = 0$$

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

$$x = \frac{2 \pm \sqrt{4 + 48}}{8}$$

$$x = \frac{2 \pm \sqrt{52}}{8} \quad x = \frac{2 \pm 2\sqrt{13}}{8}$$

$$x = \frac{2 \pm \sqrt{4} \sqrt{13}}{8} \quad x = \frac{1 \pm \sqrt{13}}{4}$$

7.  $x^{2/3} = 16$

$$(\sqrt[3]{x})^2 = (16)^{1/2}$$

$$\sqrt[3]{x}^3 = (\pm 4)^3$$

$$x = \pm 64$$

8.  $\sqrt[3]{x+4} = 2$

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

$$x = -8$$

9.  $(x^2)(\sqrt{12-x})^2$

$$x^2 = 12 - x$$

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

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

$$x+4=0$$

$$x-3=0$$

$$x = -4$$

$$x = 3$$

$$x = -4, 3$$

10.  $\frac{3}{x^2-9} = \frac{6}{x+3}$

$$3(x+3) = 6(x^2-9)$$

$$3x+9 = 6x^2-54$$

$$0 = 6x^2 - 3x - 63$$

$$0 = 3(2x^2 - x - 21)$$

$$0 = 3(2x-7)(x+3)$$

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

$$x = 7/2$$

$$x = -3$$

$$x = 7/2, -3 \text{ extr.}$$

11.  $\frac{3}{x^2-4} = \frac{2}{x+2} + \frac{x}{x-2}$  LCD =  $(x+2)(x-2)$

$$\frac{3}{(x+2)(x-2)} = \frac{2(x-2)}{(x+2)(x-2)} + \frac{x(x+2)}{(x+2)(x-2)}$$

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

$$3 = 2x - 4 + x^2 + 2x$$

$$0 = x^2 + 4x - 7$$

$$x = \frac{-4 \pm \sqrt{16 - 4(1)(-7)}}{2(1)}$$

$$x = \frac{-4 \pm \sqrt{44}}{2}$$

$$x = \frac{-4 \pm 2\sqrt{11}}{2}$$

$$x = \frac{-4 \pm \sqrt{4}\sqrt{11}}{2}$$

$$x = -2 \pm \sqrt{11}$$