

# AA PREP—SOLVING QUADRATIC EQUATIONS WORKSHEET #2

KEY

Solve each quadratic equation using the specified method. Simplify radicals!

1. Solve by taking the square root.

a)  $\sqrt{x^2} = \sqrt{48}$   
 $\quad \quad \quad \uparrow$   
 $\quad \quad \quad 16 \cdot 3$

$(4 \cdot 4)$

$x = \pm 4\sqrt{3}$

b)  $\frac{2}{5}(x+3)^2 - 4 = 36$   
 $\quad \quad \quad +4 \quad +4$

$\frac{5}{2} \cdot \frac{2}{5} (x+3)^2 = \frac{40}{1} \cdot \frac{5}{2}$

$\sqrt{(x+3)^2} = \sqrt{100}$

$x+3 = \pm 10$   
 $\quad -3 \quad -3$

$x = -3 \pm 10$  -3+10 x=7  
-3-10 x=-13

2. Solve by factoring.

a)  $81x^2 - 1 = 0$

$(9x)^2 (1)^2$

$(9x-1)(9x+1) = 0$

$x = \frac{1}{9}$

$x = -\frac{1}{9}$

DIFF OF 2 SQUARES

b)  $5x^2 + 13x - 6 = 0$

$\begin{array}{ccc} & -30 & \\ 15 & \times & -2 \\ & 13 & \end{array}$  A.C

MORE COMPLICATED QUADRATIC TRINOMIAL  $a \neq 1$

$5x^2 + 15x - 2x - 6 = 0$

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

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

$x = \frac{2}{5}$

$x = -3$

3. Solve using quadratic formula.

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

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

$a=1$   $x = \frac{-1 \pm \sqrt{(1)^2 - 4(1)(-12)}}{2(1)}$

$b=1$

$c=-12$   $x = \frac{-1 \pm \sqrt{1+48}}{2}$

$x=3$   
 $x=-4$

$x = \frac{-1 \pm \sqrt{49}}{2}$

$x = \frac{-1 \pm 7}{2}$

$x = \frac{-1+7}{2} = \frac{6}{2} = 3$

$x = \frac{-1-7}{2} = \frac{-8}{2} = -4$

b)  $x^2 - 8x + 6 = 0$

$a=1$

$b=-8$

$c=6$

$x = \frac{8 \pm \sqrt{(-8)^2 - 4(1)(6)}}{2(1)}$

$x = \frac{8 \pm \sqrt{64-24}}{2}$

$x = \frac{8 \pm \sqrt{40}}{2}$

$x = \frac{8 \pm 2\sqrt{10}}{2}$

$x = 4 \pm \sqrt{10}$

4. Solve by completing the square.

a)  $x^2 + 12x + 4 = 0$   
 $\quad \quad \quad -4 \quad -4$

$x^2 + 12x = -4$

$\frac{12}{2} = (6)^2 = 36$

$x^2 + 12x + 36 = -4 + 36$

$\sqrt{(x+6)^2} = \sqrt{32}$

$x+6 = \pm 4\sqrt{2}$   
 $\quad -6 \quad -6$

$x = -6 \pm 4\sqrt{2}$

b)  $5x^2 - 20x - 7 = 0$

$5x^2 - 20x = 7$   
 $\quad \quad \quad +7 \quad +7$

$5(x^2 - 4x) = 7$

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

$5(x^2 - 4x + 4) = 7 + 20$

$5(x-2)^2 = 27$

$\sqrt{(x-2)^2} = \sqrt{\frac{27}{5}} = \frac{\sqrt{27}}{\sqrt{5}} = \frac{3\sqrt{3}}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{3\sqrt{15}}{5}$

$x-2 = \pm \frac{3\sqrt{15}}{5}$

$x = 2 \pm \frac{3\sqrt{15}}{5}$