

AA PREP—SOLVING QUADRATIC EQUATIONS WORKSHEET #1

KEY

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

1. Solve by taking the square root.

a) $\sqrt{x^2} = \sqrt{\frac{9}{2}} = \frac{\sqrt{9}}{\sqrt{2}} = \frac{3}{\sqrt{2}} = \frac{3}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{3\sqrt{2}}{2}$

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

b) $\frac{3}{2}(x+4)^2 - 12 = 18$
 $\phantom{\frac{3}{2}(x+4)^2} + 12 + 12$

$\frac{2}{3} \cdot \frac{3}{2} (x+4)^2 = \frac{30}{1} \cdot \frac{2}{3}$

$\sqrt{(x+4)^2} = \sqrt{20}$

$x+4 = \pm 2\sqrt{5}$
 $-4 \quad -4$

$x = -4 \pm 2\sqrt{5}$

2. Solve by factoring.

a) $9x^2 - 49 = 0$ DIFF OF 2 SQUARES

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

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

$x = \frac{7}{3}$

$x = -\frac{7}{3}$

b) $-x^2 + x + 90 = 0$

$-1(x^2 - x - 90) = 0$
 $\begin{array}{cc} -90 & a \cdot c \\ -10 & \times & 9 \\ & -1 & b \end{array}$

CRF!
 1st!
 BASIC QUADRATIC TRINOMIAL
a=1

$-(x-10)(x+9) = 0$

$x = 10$

$x = -9$

3. Solve using quadratic formula. $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

a) $x^2 + 2x - 15 = 0$

$a=1$ $x = \frac{-2 \pm \sqrt{(2)^2 - 4(1)(-15)}}{2(1)}$

$b=2$

$c=-15$ $x = \frac{-2 \pm \sqrt{4 + 60}}{2}$

$x = 3$
 $x = -5$

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

$x = \frac{-2 \pm 8}{2}$

$x = \frac{-2+8}{2} = \frac{6}{2} = 3$

$x = \frac{-2-8}{2} = \frac{-10}{2} = -5$

b) $x^2 - 4x - 2 = 0$

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

$b=-4$

$c=-2$ $x = \frac{4 \pm \sqrt{16 + 8}}{2}$

$x = \frac{4 \pm \sqrt{24}}{2}$

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

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

4. Solve by completing the square.

a) $x^2 + 10x - 2 = 0$
 $ + 2 + 2$

$x^2 + 10x = 2$

↓

$\frac{10}{2} = (5)^2 = 25$

$x^2 + 10x + 25 = 2 + 25$

$\sqrt{(x+5)^2} = \sqrt{27}$

$x+5 = \pm 3\sqrt{3}$
 $-5 \quad -5$

$x = -5 \pm 3\sqrt{3}$

b) $3x^2 - 12x - 13 = 0$
 $ + 13 + 13$

$3x^2 - 12x = 13$

$3(x^2 - 4x) = 13$

↓
 $-\frac{4}{2} = (-2)^2 = 4$

$3(x^2 - 4x + 4) = 13 + 12$

$3(x-2)^2 = 25$

$\sqrt{(x-2)^2} = \sqrt{\frac{25}{3}} = \frac{\sqrt{25}}{\sqrt{3}} = \frac{5}{\sqrt{3}} = \frac{5}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{5\sqrt{3}}{3}$

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

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