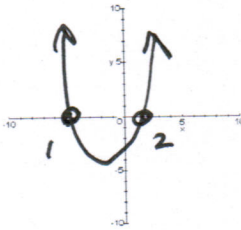


1.) a.) What are the names for other names for the solution to a quadratic equation?

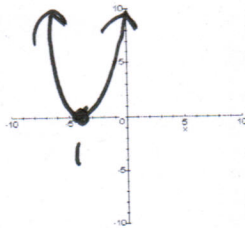
Solutions      ROOTS      ZEROS      X-INTERCEPTS

b.) Sketch a graph with for each of the following numbers of solutions:

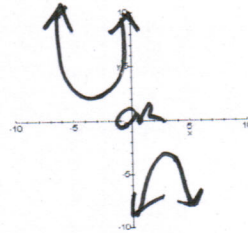
2 Solutions



1 Solution



No Solutions



2.) Write the following expressions in simplest radical form.

a.)  $\sqrt{224}$

$$\begin{array}{c} \sqrt{224} \\ \swarrow \quad \searrow \\ 4 \quad 56 \\ \swarrow \quad \searrow \quad \swarrow \quad \searrow \\ 2 \quad 2 \quad 7 \quad 8 \\ \swarrow \quad \searrow \quad \swarrow \quad \searrow \quad \swarrow \quad \searrow \\ 2 \quad 2 \quad 7 \quad 2 \quad 4 \quad 2 \\ \swarrow \quad \searrow \quad \swarrow \quad \searrow \\ 2 \quad 2 \quad 7 \quad 2 \end{array}$$

$2 \cdot 2 \cdot 2 \cdot 2 \cdot 7$

$4\sqrt{14}$

b.)  $3\sqrt{8} \cdot 6\sqrt{6}$

$$\begin{array}{c} 3 \cdot 6 \sqrt{8 \cdot 6} \\ \swarrow \quad \searrow \quad \swarrow \quad \searrow \\ 4 \quad 2 \quad 3 \quad 2 \\ \swarrow \quad \searrow \quad \swarrow \quad \searrow \\ 2 \cdot 2 \cdot 2 \cdot 3 \cdot 2 \\ 3 \cdot 6 \cdot 2 \cdot 2 \sqrt{3} \\ \boxed{72\sqrt{3}} \end{array}$$

c.)  $4\sqrt{20} \cdot 5\sqrt{30}$

$$\begin{array}{c} 4 \cdot 5 \sqrt{20 \cdot 30} \\ \swarrow \quad \searrow \quad \swarrow \quad \searrow \\ 10 \quad 2 \quad 3 \quad 10 \\ \swarrow \quad \searrow \quad \swarrow \quad \searrow \quad \swarrow \quad \searrow \\ 5 \cdot 2 \quad 2 \quad 3 \quad 5 \cdot 2 \\ 5 \cdot 5 \cdot 2 \cdot 2 \cdot 3 \cdot 2 \\ 4 \cdot 5 \cdot 5 \cdot 2 \sqrt{6} \\ \boxed{200\sqrt{6}} \end{array}$$

3.) Solve the following equations using square roots. Express any radical answers in simplest form.

a.)  $x^2 + 7 = 19$

$$\begin{array}{c} x^2 + 7 = 19 \\ -7 \quad -7 \\ x^2 = 12 \\ x = \pm \sqrt{12} \\ \swarrow \quad \searrow \\ 4 \quad 3 \\ \swarrow \quad \searrow \\ 2 \cdot 2 \end{array}$$

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

b.)  $\sqrt{(x+1)^2} = \sqrt{16}$

$$\begin{array}{c} x+1 = \pm 4 \\ \swarrow \quad \searrow \\ x+1 = 4 \quad x+1 = -4 \\ -1 \quad -1 \quad -1 \quad -1 \\ \boxed{x = 3} \quad \boxed{x = -5} \end{array}$$

c.)  $3(x+1)^2 - 7 = 41$

$$\begin{array}{c} 3(x+1)^2 - 7 = 41 \\ +7 \quad +7 \\ \frac{3(x+1)^2}{3} = \frac{48}{3} \\ (x+1)^2 = 16 \\ x+1 = \pm 4 \\ \swarrow \quad \searrow \\ x+1 = 4 \quad x+1 = -4 \\ \boxed{x = 3} \quad \boxed{x = -5} \end{array}$$

4.) Factor and solve the following quadratic equations. Express your solutions as ordered pairs (x,y).

a.)  $x^2 + 2x - 3 = 0$

$a=1$   $c=-3$

$ac = -3$   $(-1 \cdot 3)$

$x^2 - 1x + 3x - 3 = 0$

$x^2 - 1x + 3x - 3 = 0$

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

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

$x-1=0$     $x+3=0$

$x=1$     $x=-3$

$(1,0)$     $(-3,0)$

b.)  $3x^2 + 11x - 4 = 0$

$a=3$     $c=-4$

$ac = -12$   $(12 \cdot -1)$

$3x^2 - 1x + 12x - 4 = 0$

$3x^2 - 1x + 12x - 4 = 0$

$x(3x-1) + 4(3x-1) = 0$

$(3x-1)(x+4) = 0$

$3x-1=0$     $x+4=0$

$3x=1$     $x=-4$

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

$(\frac{1}{3}, 0)$     $(-4, 0)$

c.)  $18x^2 - 27x + 10 = 0$

$a=18$     $c=10$

$ac = 180$   $(-12 \cdot -15)$

$18x^2 - 12x - 15x + 10 = 0$

$18x^2 - 12x - 15x + 10 = 0$

$6x(3x-2) - 5(3x-2) = 0$

$(3x-2)(6x-5) = 0$

$3x-2=0$     $6x-5=0$

$3x=2$     $6x=5$

$x = \frac{2}{3}$     $x = \frac{5}{6}$

$(\frac{2}{3}, 0)$     $(\frac{5}{6}, 0)$