

Algebra I

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2.)	$\{2, 4\}$	$x^2 - 4x - 3 = 0$	$f(x) = -\frac{2}{3}(x-1)^2 + 6$
4.)	$\left\{\frac{3 \pm \sqrt{5}}{2}\right\}$	$16x^2 + 16x - 1 = 0$	$f(x) = \frac{4}{5}(x-\frac{1}{5})^2 - 5$
6.)	$\left\{\pm \frac{2\sqrt{3}}{3}\right\}$	$x^2 + 8 = 0$	$f(x) = \frac{2}{9}(x+1)^2 - 10$
8.)	$x^2 + 2x - 3 = 0$	$x^2 - 8x + 20 = 0$	$f(x) = -(x+3)^2 + 9$
10.)	$4x^2 - 4x - 3 = 0$	$x^2 + 4x + 11 = 0$	$f(x) = \frac{4}{9}(x-3)^2 - 4$
12.)	$4x^2 - 5 = 0$	$4x^2 - 8x + 7 = 0$	$f(x) = -(x-1)^2 + 9$

6)  $3u^2 - 4 = 0$

$3u^2 = 4$

$\sqrt{u^2} = \sqrt{\frac{4}{3}}$

$|u| = \frac{2\sqrt{3}}{3}$

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

$\left\{\pm \frac{2\sqrt{3}}{3}\right\}$

8)  $\{-3, 1\}$

$x = -3 \quad x = 1$

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

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

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

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

10)  $\left\{\frac{3}{2}, -\frac{1}{2}\right\}$

$2(x - \frac{3}{2})(x - \frac{1}{2}) = 2$

$2x = 3 \quad 2x = -1$

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

$4x^2 + 2x - 6x - 3 = 0$

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

14)  $\left\{\frac{-2 \pm \sqrt{5}}{4}\right\}$

$(x = \frac{-2 + \sqrt{5}}{4}) \quad x = \frac{-2 - \sqrt{5}}{4}$

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

$(4x + 2 - \sqrt{5})(4x + 2 + \sqrt{5}) = 0$

$16x^2 + 8x + 4 + 2\sqrt{5} - 6x - 2\sqrt{5} - 4x - 2 - \sqrt{5} - 4x - 2 + \sqrt{5} = 0$

$16x^2 + 16x - 1 = 0$

20)  $\{4 \pm 2i\}$

$x = 4 + 2i \quad x = 4 - 2i$

$x - 4 - 2i = 0 \quad x - 4 + 2i = 0$

$(x - 4 - 2i)(x - 4 + 2i) = 0$

$x^2 - 4x + 2xi - 4x + 16 - 8i - 2xi + 8i - 4i^2 = 0$

$x^2 - 8x + 20 = 0$

28) min:  $-5 \rightarrow$  vertex  $(\frac{1}{2}, -5)$   
 x-ints  $\{-2, 3\} \rightarrow (-2, 0) > (3, 0)$   
 axis of symmetry  $x = \frac{1}{2}$

$y = a(x-h)^2 + k$   
 $y = a(x - \frac{1}{2})^2 - 5$

Temp  $\begin{cases} 0 = a(3 - \frac{1}{2})^2 - 5 \\ 5 = a(\frac{3}{2})^2 \\ 5 = \frac{9a}{4} \\ \frac{4}{9} \cdot 5 = a \quad a = \frac{4}{9} \end{cases}$

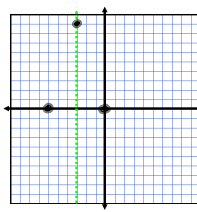
$y = \frac{4}{9}(x - \frac{1}{2})^2 - 5$

32) max:  $9 \rightarrow k$  vertex  $(-3, 9)$   
 zeros  $\{-6, 0\}$  axis:  $x = -3 \rightarrow h$   
 $(-6, 0)$   $(0, 0)$

$F(x) = a(x-h)^2 + k$   
 $F(x) = a(x+3)^2 + 9$

Temp  $\begin{cases} 0 = a(0+3)^2 + 9 \\ -9 = 9a \\ -1 = a \end{cases}$

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



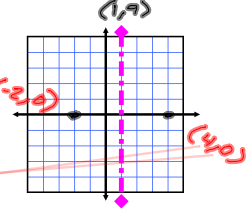
roots, solutions  
zeros, x-intercepts

36) range:  $(-\infty, 9] \rightarrow$  max  
 x-ints  $\{-2, 4\}$   
 vertex  $(1, 9)$

$F(x) = a(x-h)^2 + k$

Temp  $\begin{cases} 0 = a(4-1)^2 + 9 \\ -9 = 3^2 a \\ -1 = a \end{cases}$

$F(x) = -(x-1)^2 + 9$



36) range:  $(-\infty, 9] \rightarrow$  max  
 x-ints  $\{-2, 4\}$   
 vertex  $(1, 9)$

$F(x) = a(x-h)^2 + k$

$0 = a(4-1)^2 + 9$   
 $-9 = 3^2 a$   
 $-1 = a$

$F(x) = -(x-1)^2 + 9$

