Quadratic Equations 1 (KEY)

Precal

Give the quadratic, linear, and constant terms of the following equations.

1) $y = 3x^2 + 4x + 5$ 2) $d = -10 + 8c - c^2$ 3) $y = 3x + 7$ 4) $y = 3(4x^2 - 6)$

Quad = $3x^2$	Quad = $-c^2$	Quad = $0x^2$	Quad = $12x^2$
Linear = $4x$	Linear = $8c$	Linear = $3x$	Linear = $0x$
Constant = 5	Constant = -10	Constant = 7	Constant = -18

Give the values of a, b, and c in the following quadratic equations.

5) $y = 5x^2 - 12x + 8$ 6) $y = 3x^2 - 10$ 7) $y = -2x^2$ 8) $y = (2x + 5)(x - 3)$

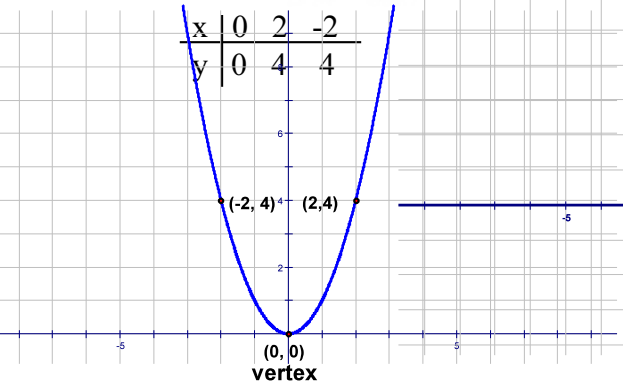
a = 5, b = -12, c = 8	a = 3, b = 0, c = -10	a = -2, b = 0, c = 0	a = 2, b = -1, c = -15

9) What is the graph of an equation? - The set of points whose coordinates satisfy the equation.

Graph the following quadratic equations by finding the vertex and two other points using a t-table. Check at least one of the points to make sure it satisfies the equation.

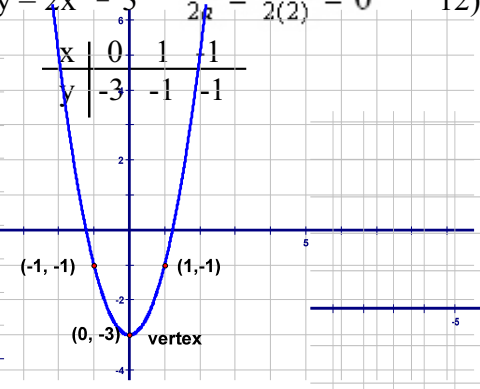
10) $y = x^2$ $\frac{-b}{2a} = \frac{0}{2(1)} = 0$

x	0	2	-2
y	0	4	4



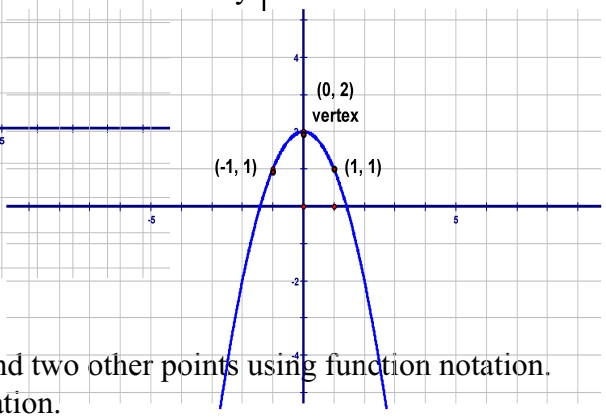
11) $y = 2x^2 - 3$ $\frac{-b}{2a} = \frac{0}{2(2)} = 0$

x	0	1	-1
y	-3	-1	-1



12) $y = -x^2 + 2$

x	0	1	-1
y	2	1	1



Graph the following quadratic equations by finding the vertex and two other points using function notation. Check at least one of the points to make sure it satisfies the equation.

13) $f(x) = 2x^2 - 8x + 12$

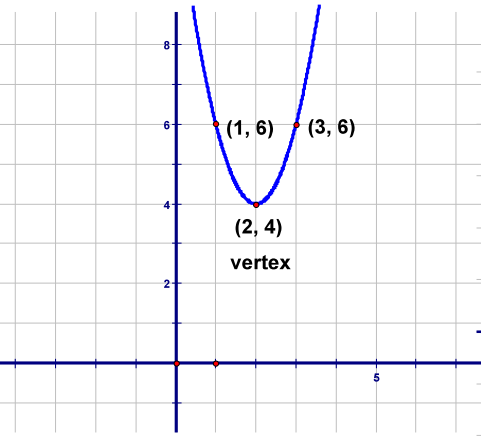
$\frac{-(-8)}{2(2)} = \frac{8}{4} = 2$

vertex $\rightarrow f(2) = 2(2)^2 - 8(2) + 12$

$= 8 - 16 + 12$

$= 4$

(2, 4)



14) $f(x) = -3x^2 - 24x - 39$

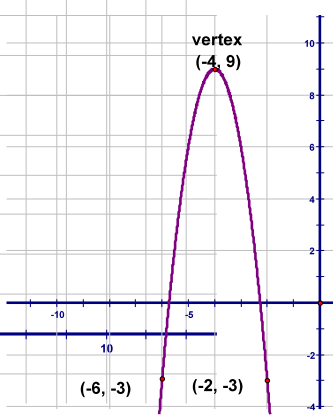
$\frac{-(-24)}{2(-3)} = \frac{24}{-6} = -4$

vertex $\rightarrow f(-4) = -3(-4)^2 - 24(-4) - 39$

$= (-48) + 96 - 39$

$= 9$

(-4, 9)



15) $f(x) = x^2 + x - 6$

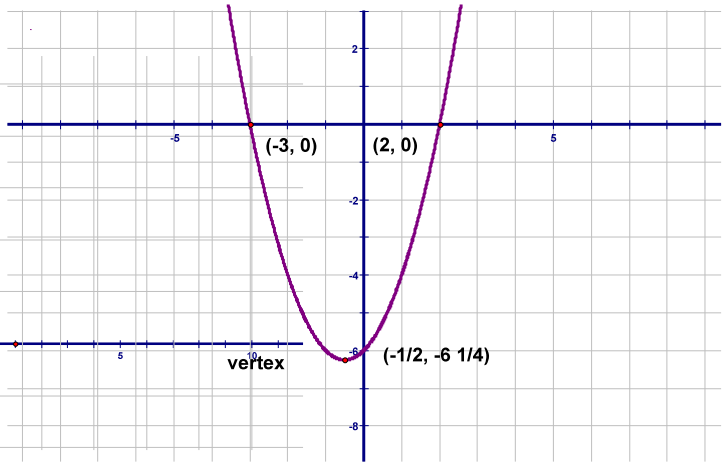
$\frac{-1}{2(1)} = \frac{-1}{2}$

vertex $\rightarrow f(-1/2) = (-1/2)^2 + (-1/2) - 6$

$= 1/4 - 1/2 - 6$

$= -6\ 1/4$

(-½, -6 1/4)



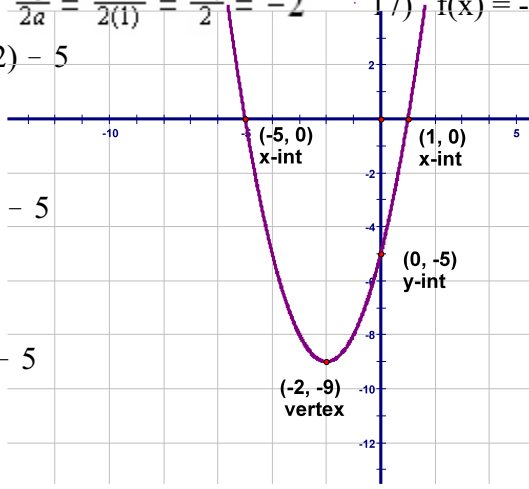
Graph the following equations labeling the vertex, the y-intercept, and the x-intercepts.

16) $y = x^2 + 4x - 5$ $\quad \frac{-b}{2a} = \frac{-(4)}{2(1)} = \frac{-4}{2} = -2$

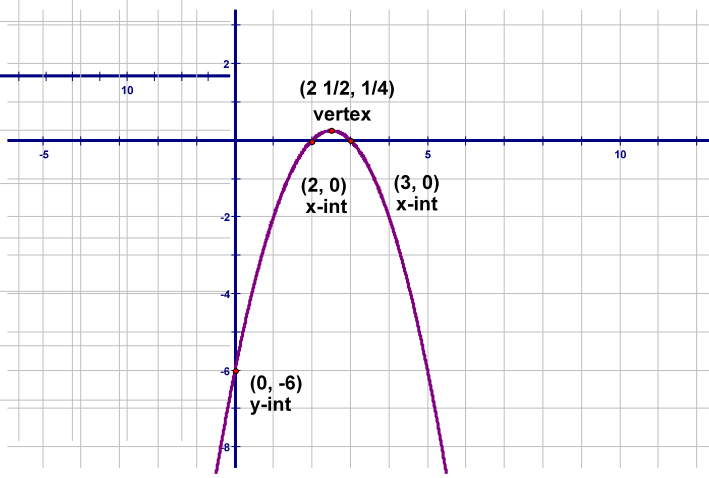
vertex → $y = (-2)^2 + 4(-2) - 5$
$= 4 - 8 - 5$
$= -9$
$(-2, -9)$

x-int → $y = (-5)^2 + 4(-5) - 5$
$= 25 - 20 - 5$
$= 0$
$(-5, 0)$

x-int → $y = (1)^2 + 4(1) - 5$
$= 1 + 4 - 5$
$= 0$
$(1, 0)$

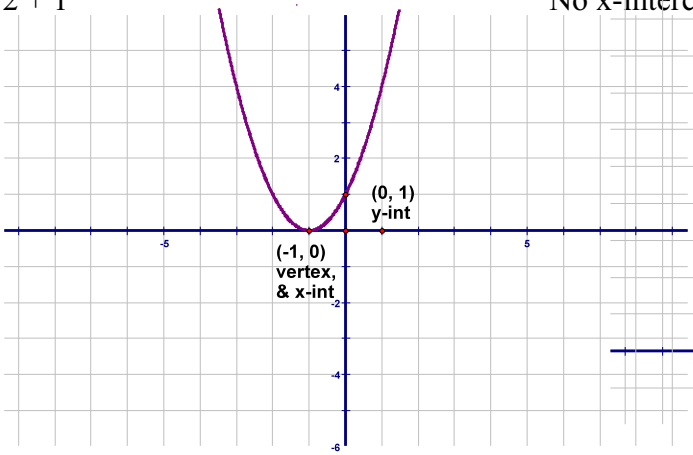


17) $f(x) = -x^2 + 5x - 6$ $\quad \frac{-b}{2a} = \frac{-(5)}{2(-1)} = \frac{-5}{-2} = \frac{5}{2}$



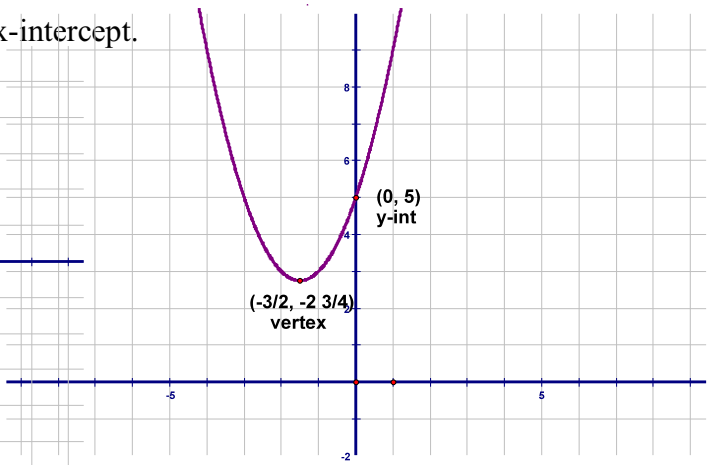
18) $f(c) = c^2 + 2c + 1$ $\quad \frac{-b}{2a} = \frac{-(2)}{2(1)} = \frac{-2}{2} = -1$

vertex → $y = (-1)^2 + 2(-1) + 1$
$= 1 - 2 + 1$
$= 0$
$(-1, 0)$



19) $y = x^2 + 3x + 5$ $\quad \frac{-3}{2(1)} = \frac{-3}{2}$

No x-intercept.



Solve the following equations.

20) $0 = x^2 - 4x - 21$
$0 = (x - 7)(x + 3)$

$x = 7, -3$

21) $0 = x^2 + x - 12$
$0 = (x + 4)(x - 3)$

$x = -4, 3$

22) $0 = 2b^2 + 10b - 12$
$0 = 2(b^2 + 5b - 6)$
$0 = 2(b + 6)(b - 1)$

$x = -6, 1$

23) $0 = x^2 - 49$
$0 = (b - 7)(b + 7)$

$x = 7, -7$

24) $0 = 3w^2 - 48$
$0 = 3(w^2 - 16)$
$0 = 3(w - 4)(w + 4)$

$x = 4, -4$

25) $0 = 10w^2 + 11w - 6$
$0 = (2w + 3)(5w - 2)$

$x = -3/2, 2/5$