Math 2 Honors Name_____

# Graphing Quadratics in Standard Form

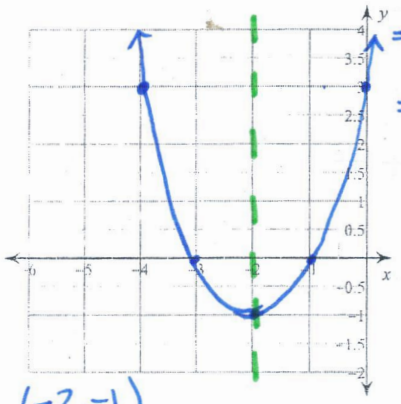
Date_____ Period____

(V) (A of S)

**Sketch the graph of each function. Write the vertex and the axis of symmetry. Then change the equation to standard form by FOIL and combining like terms.**

(St)

1) $f(x) = (x+2)^2 - 1$ → $(x+2)(x+2)-1$



$= x^2+2x+2x+4-1$

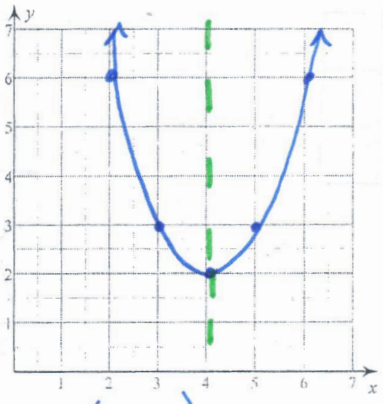
$= x^2+4x+3$

V: $(-2,-1)$

A of S: $x=-2$

St: $y = x^2+4x+3$

2) $f(x) = (x-4)^2 + 2$ → $(x-4)(x-4)+2$



$= x^2-4x-4x+16+2$

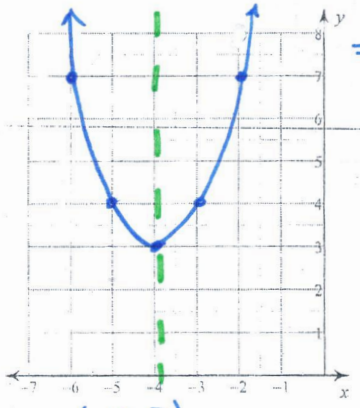
$= x^2-8x+18$

V: $(4,2)$

A of S: $x=4$

St: $y = x^2-8x+18$

3) $f(x) = (x+4)^2 + 3$ → $x^2+4x+4x+16+3$



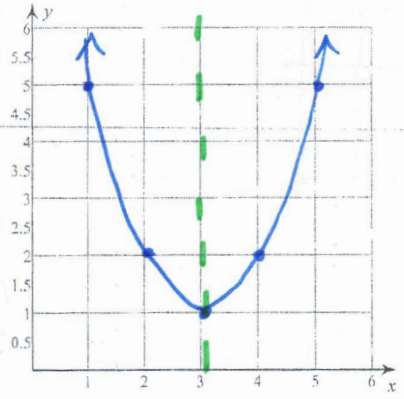
$= x^2+8x+19$

V: $(-4,3)$

A of S: $x=-4$

St: $y = x^2+8x+19$

4) $f(x) = (x-3)^2 + 1$ → $x^2-3x-3x+9+1$



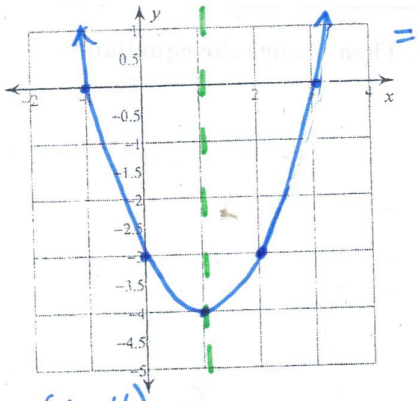
$= x^2-6x+10$

V: $(3,1)$

A of S: $x=3$

St: $y = x^2-6x+10$

5) $f(x) = (x-1)^2 - 4$ → $x^2 - x - x + 1 - 4$



$= x^2 - 2x - 3$

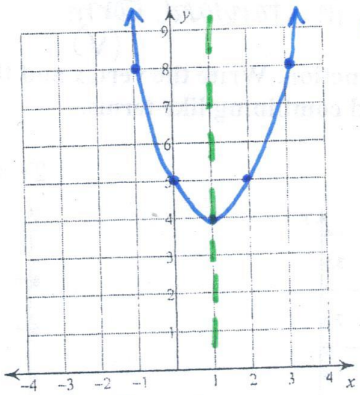
V: (1, -4)

A of S: $x = 1$

St: $y = x^2 - 2x - 3$

6) $f(x) = (x-1)^2 + 4$ → $x^2 - x - x + 1 + 4$

$= x^2 - 2x + 5$

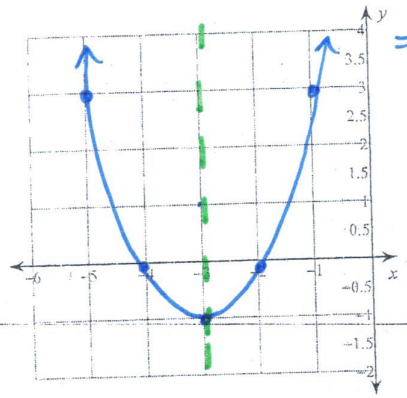


V: (1, 4)

A of S: $x = 1$

St: $y = x^2 - 2x + 5$

7) $f(x) = (x+3)^2 - 1$ → $x^2 + 3x + 3x + 9 - 1$



$= x^2 + 6x + 8$

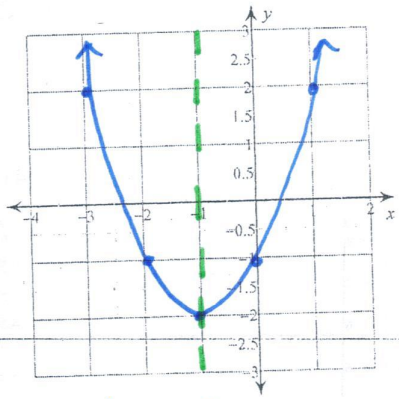
V: (-3, -1)

A of S: $x = -3$

St: $y = x^2 + 6x + 8$

8) $f(x) = (x+1)^2 - 2$ → $x^2 + x + x + 1 - 2$

$= x^2 + 2x - 1$



V: (-1, -2)

A of S: $x = -1$

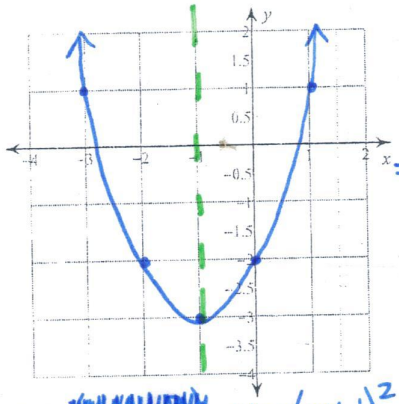
St: $y = x^2 + 2x - 1$

(VF) (V) (A of S)

**Change the equation to vertex form by completing the square. Graph it. Write the vertex and the axis of symmetry.**

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

$\frac{+2}{2} = (+1)^2$



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

VF: $y = (x+1)^2 - 3$

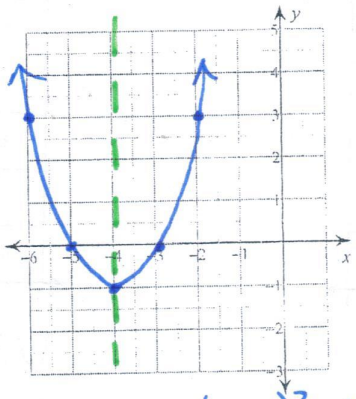
V: $(-1, -3)$

A of S: $x = -1$

10) $f(x) = x^2 + 8x + 15$ → $(x^2+8x+16) + 15 - 16$

$\frac{+8}{2} = (4)^2$

$= (x+4)^2 - 1$



VF: $y = (x+4)^2 - 1$

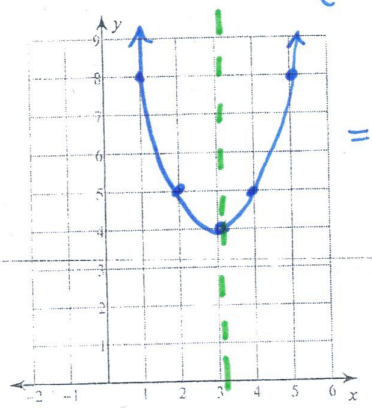
V: $(-4, -1)$

A of S: $x = -4$

11) $f(x) = x^2 - 6x + 13$ = $(x^2-6x+9) + 13 - 9$

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

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



VF: $y = (x-3)^2 + 4$

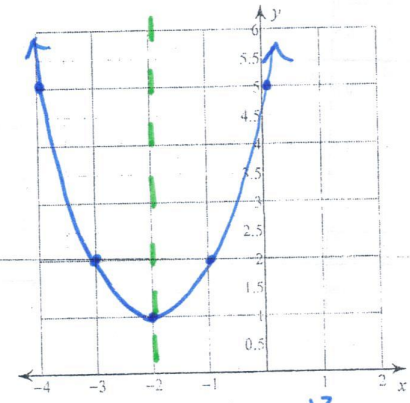
V: $(3, 4)$

A of S: $x = 3$

12) $f(x) = x^2 + 4x + 5$ = $(x^2+4x+4) + 5 - 4$

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

$= (x+2)^2 + 1$



VF: $y = (x+2)^2 + 1$

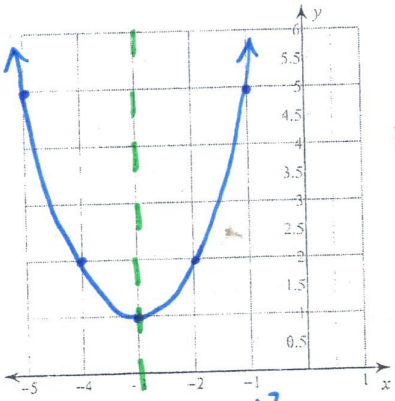
V: $(-2, 1)$

A of S: $x = -2$

13) $f(x) = x^2 + 6x + 10$ $= (x^2+6x+\underline{9}) + 10 - \underline{9}$

$\frac{+6}{2} = (+3)^2$

$= (x+3)^2 + 1$



VF: $y = (x+3)^2 + 1$

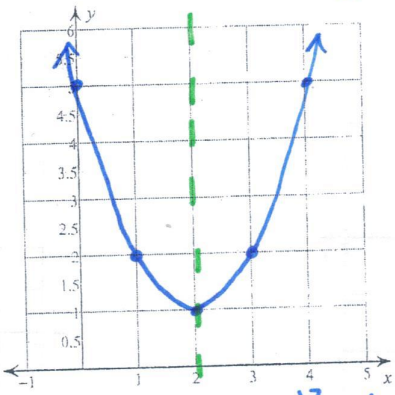
V: $(-3, 1)$

A of S: $x = -3$

14) $f(x) = x^2 - 4x + 5$ $= (x^2-4x+\underline{4}) + 5 - \underline{4}$

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

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



VF: $y = (x-2)^2 + 1$

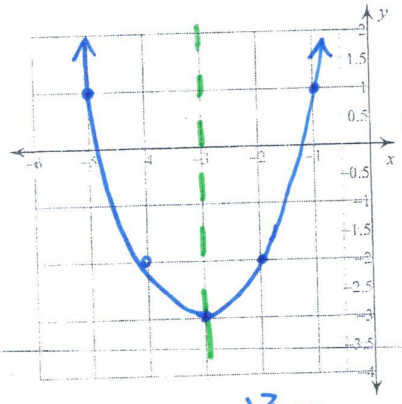
V: $(2, 1)$

A of S: $x = 2$

15) $f(x) = x^2 + 6x + 6$ $= (x^2+6x+\underline{9}) + 6 - \underline{9}$

$\frac{+6}{2} = (+3)^2$

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



VF: $y = (x+3)^2 - 3$

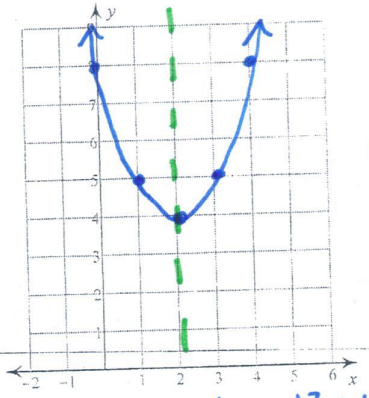
V: $(-3, -3)$

A of S: $x = -3$

16) $f(x) = x^2 - 4x + 8$ $= (x^2-4x+\underline{4}) + 8 - \underline{4}$

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

$= (x-2)^2 + 4$



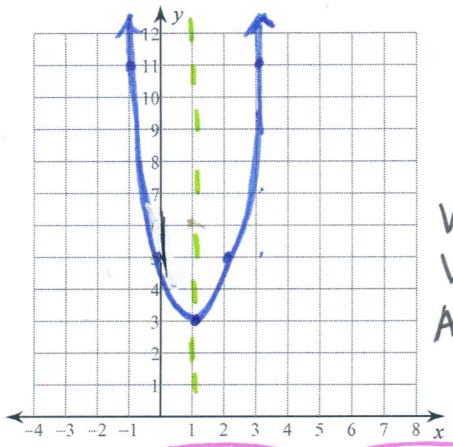
VF: $y = (x-2)^2 + 4$

V: $(2, 4)$

A of S: $x = 2$

**Sketch the graph of each function.**

17) $y = 2x^2 - 4x + 5$



VF: $2(x-1)^2+3$

V: $(1,3)$

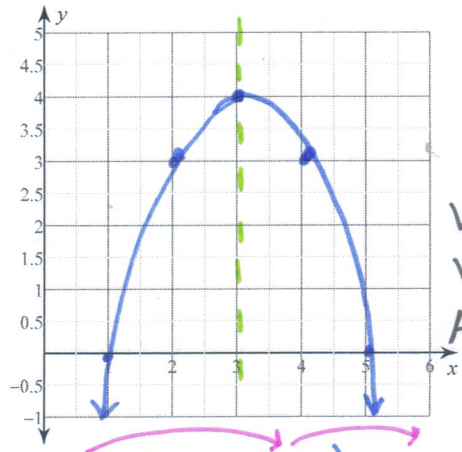
AofS: $x=1$

$2(x^2-2x+\underline{1})+5-\underline{2}$

$\left(\frac{-2}{2}\right)^2=(-1)^2=1$

$2(x-1)^2+3$

18) $y = -x^2 + 6x - 5$



VF: $-1(x-3)^2+4$

V: $(3,4)$

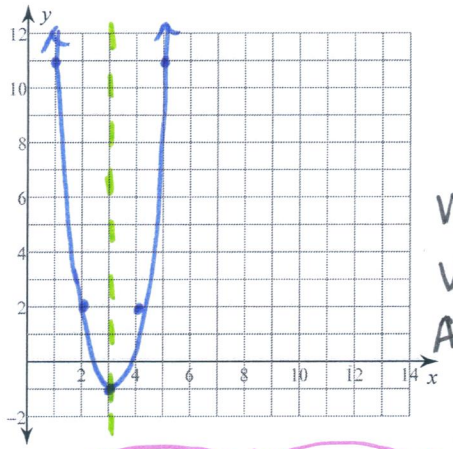
AofS: $x=3$

$-1(x^2-6x+\underline{9})-5+\underline{+9}$

$\left(\frac{-6}{2}\right)^2=(-3)^2=9$

$-1(x-3)^2+4$

19) $y = 3x^2 - 18x + 26$



VF: $3(x-3)^2-1$

V: $(3,-1)$

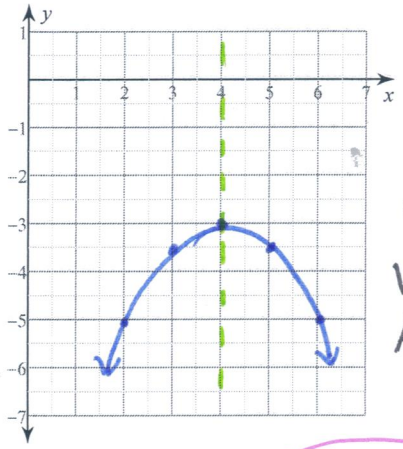
AofS: $x=3$

$3(x^2-6x+\underline{9})+26-\underline{27}$

$\left(\frac{-6}{2}\right)^2=(-3)^2=9$

$3(x-3)^2-1$

20) $y = -\frac{1}{2}x^2 + 4x - 11$



VF: $-\frac{1}{2}(x-4)^2-3$

V: $(4,-3)$

AofS: $x=4$

$-\frac{1}{2}(x^2-8x+\underline{16})-11+\underline{+8}$

$\left(\frac{-8}{2}\right)^2=(-4)^2=16$

$-\frac{1}{2}(x-4)^2-3$