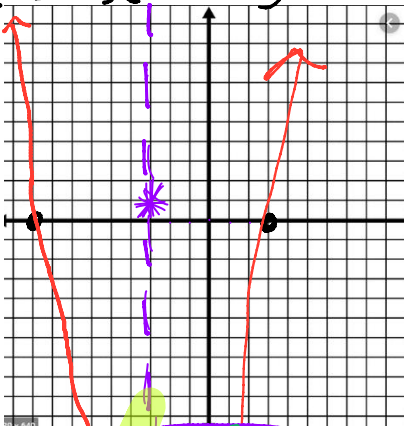1) $y = (x - 3)(x + 9)$

What form is it in?

Intercept form

Vertex: Middle of x-ints

$(-3, -36)$

$(-3-3)(-3+9)$

x-intercepts: $(3,0) \quad (-9,0)$

$\begin{array}{ll} x-3=0 & x+9=0 \\ +3 \ +3 & -9 \ -9 \\ x=3 & x=-9 \end{array}$

standard form:

$y = x^2 + 6x - 27$

$\times$	x	-3
x	x^2	$-3x$
9	$9x$	-27

Direction:

UP→ Min

$(-3, -36)$

y-intercept: $(0, -27)$

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

What form is it in?

Intercept

Vertex:

$(1, 27)$

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

x-intercepts: $(4,0) \quad (-2,0)$

$\begin{array}{ll} x-4=0 & x+2=0 \\ +4 \ +4 & -2 \ -2 \\ x=4 & x=-2 \end{array}$

standard form:

$\times$	$-3x$	12
x	$-3x^2$	$12x$
2	$-6x$	24

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

$(-3x+12)(x+2)$

$y = -3x^2 + 6x + 24$

Direction→ Max

$(1, 27)$

y-intercept: $(0, 24)$

3) $y = \frac{1}{2}(x-3)(x+4)$

What form is it in?
Intercept

x-intercepts: $(3,0)$ $(-4,0)$
$X-3=0$ $X+4=0$
$+3 +3$ $-4 -4$
$X=3$ $X=-4$

Direction: UP

Max or min: Min $(-0.5, -6.125)$

Vertex:
$(-0.5, -6.125)$
$\frac{1}{2}(-0.5-3)(-0.5+4)$

standard form:
$y = 0.5x^2 + 0.5x - 6 \rightarrow (0,-6)$

y-intercept: $(0,-6)$

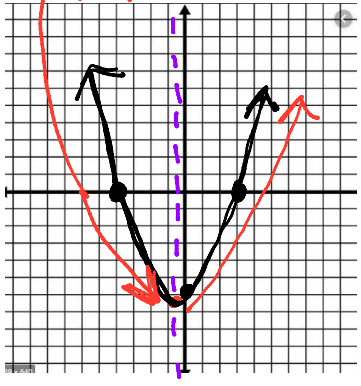**Increasing:** $(-0.5, \infty)$

Decreasing: $(-\infty, -0.5)$

Domain: $(-\infty, \infty)$

Range: $[-6.125, \infty)$

A of symm: $X = -0.5$

$\frac{1}{2}(X-3)(X+4)$
$(0.5X-1.5)(X+4)$

$0.5x \quad -1.5$

	$0.5x$	-1.5
X	$0.5x^2$	$-1.5x$
4	$2x$	-6

4) $y = -x(x+1)$

What form is it in?
Intercept

x-intercepts: $(0,0)$ $(-1,0)$
$-X=0$ $X+1=0$
$\frac{-X}{-1}=\frac{0}{-1}$ $-1 -1$
$X=0$ $X=-1$

Direction: Down

Max or min: Max $(-0.5, 0.25)$

Vertex: $(-0.5, 0.25)$
$-(-0.5)(-0.5+1)$

standard form:
$-X(X+1)$
$y = -X^2 - X$

y-intercept: $(0,0)$

Increasing: $(-\infty, -0.5)$

Decreasing: $(-0.5, \infty)$

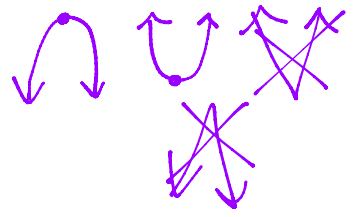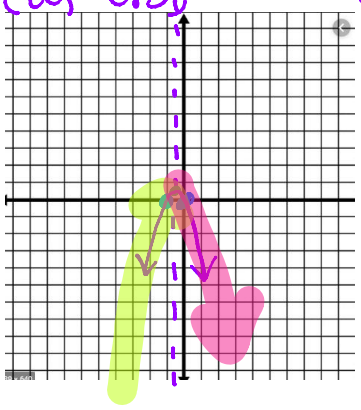**Domain:** $(-\infty, \infty)$

Range: $(-\infty, 0.25]$

axis of symm $X = -0.5$

5) $y = 3x(x - 9)$

What form is it in?   x-intercepts: Direction: Max or min:
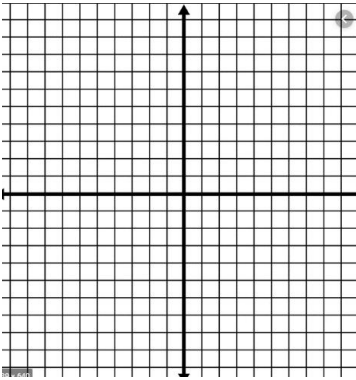
Vertex: standard form: y-intercept:

Increasing: Decreasing: Domain: Range:
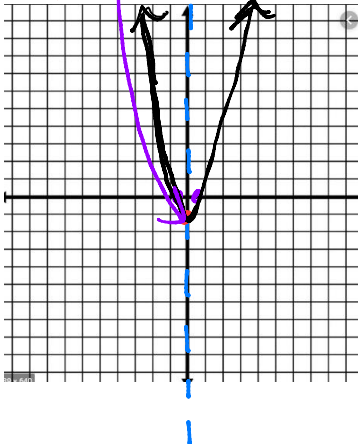

6) $y = (2x - 1)(2x + 1)$ $(0.5, 0)$ $(-0.5, 0)$

What form is it in?   x-intercepts: Direction: Max or min:

Intercept

$2x - x = 0$ $2x + x = 0$ **UP**   **Min $(0, -1)$**

$+x \quad +1$ $-x \quad -1$

$\frac{2x}{2} = \frac{1}{2}$ $x = \frac{1}{2}$ $\frac{2x}{2} = \frac{-1}{2}$

Vertex: standard form: y-intercept:

$(0, -1)$

$(2(0) - 1)(2(0) + 1)$ $y = 4x^2 - 1$ $\rightarrow$ $(0, -1)$

Increasing: Decreasing: Domain: Range:

$(0, \infty)$ $(-\infty, 0)$ $(-\infty, \infty)$ $[-1, \infty)$

axis of
sym
$x = 0$

$2x \quad -1$

	$2x$	-1
$2x$	$4x^2$	$-2x$
1	$2x$	-1

1) $(-3, 7)$ $(-5, 17)$ 2) $(12, -37)(4, -3)$

$$\frac{17-7}{-5--3} = -5$$

$$\frac{y_2 - y_1}{x_2 - x_1}$$

$$\frac{-3--37}{4-12} =$$

$$-4.25$$

steeper — larger
#