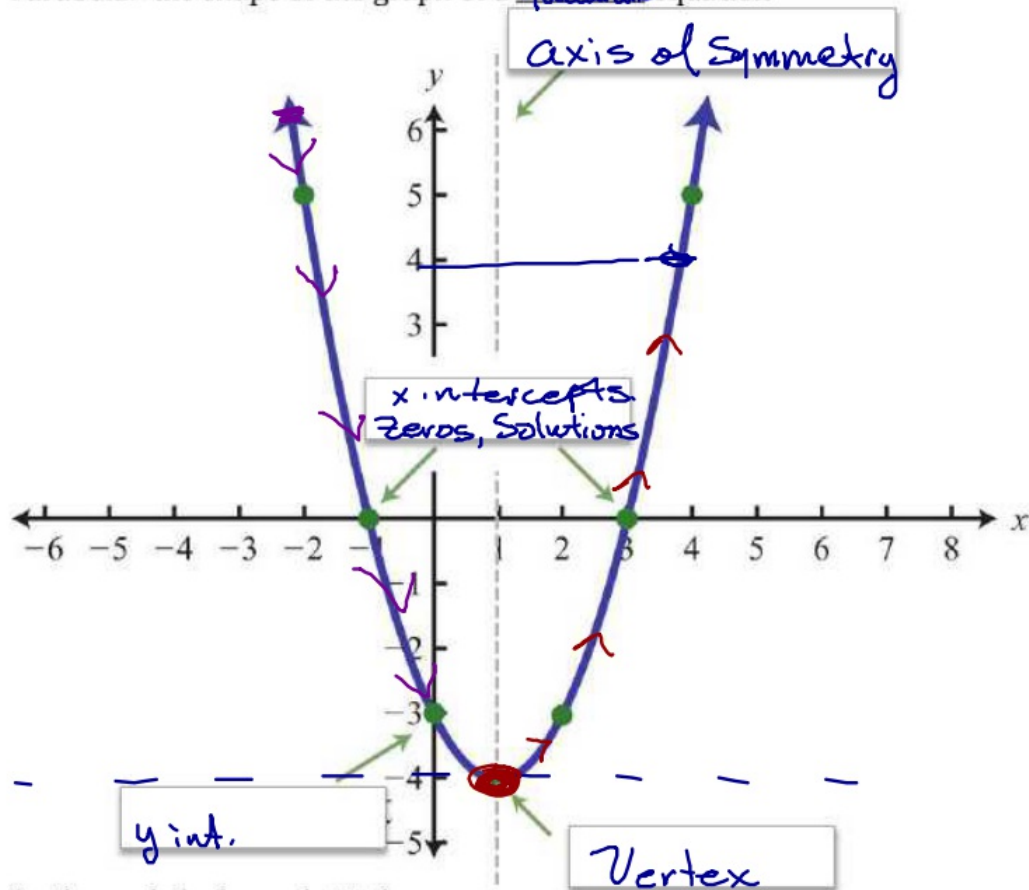


Graphing Parabolas!: Key Features

Parabola: the shape of the graph of a quadratic equation



For the parabola above what is the:

y-intercept $(0, -3)$

axis of symmetry $x=1$

x-intercept(s) $(-1, 0), (3, 0)$

vertex $(1, -4)$

y-value: minimum value $y = -4$

x-values: domain $-\infty < x < \infty$
 $(-\infty, \infty)$

y-values: range $-4 \leq y < \infty$
 $[-4, \infty)$

Where is the parabola increasing? $(1, \infty)$

→ x-values
 Where is the parabola decreasing? $(-\infty, 1)$

Example: Set Notation: $x: [3, \infty)$
 $y: (-\infty, 76]$

Interval Notation: $-3 \leq x \leq \infty$
 $-\infty < y \leq 76$

Graphing Quadratics Unit IN CLASS Day 1 NO CALCULATOR

y-intercept of a graph is the point where $x = 0$ and lies on the y-axis.

x-intercept(s) of a graph are the point(s) where $y = 0$ and lie on the x-axis. Zeros or Solutions

Axis of symmetry is a line that cuts the graph in two vertically. It is always written as an equation.

Vertex of a parabola is a point where the parabola is at its very highest point (**maximum**) or very lowest point (**minimum**). (AOS, min, max)

Maximum value is the y-value at the parabola's highest point.

Minimum value is the y-value at the parabola's lowest point.

Range is all the possible x-values of a function. $(-\infty, \infty)$

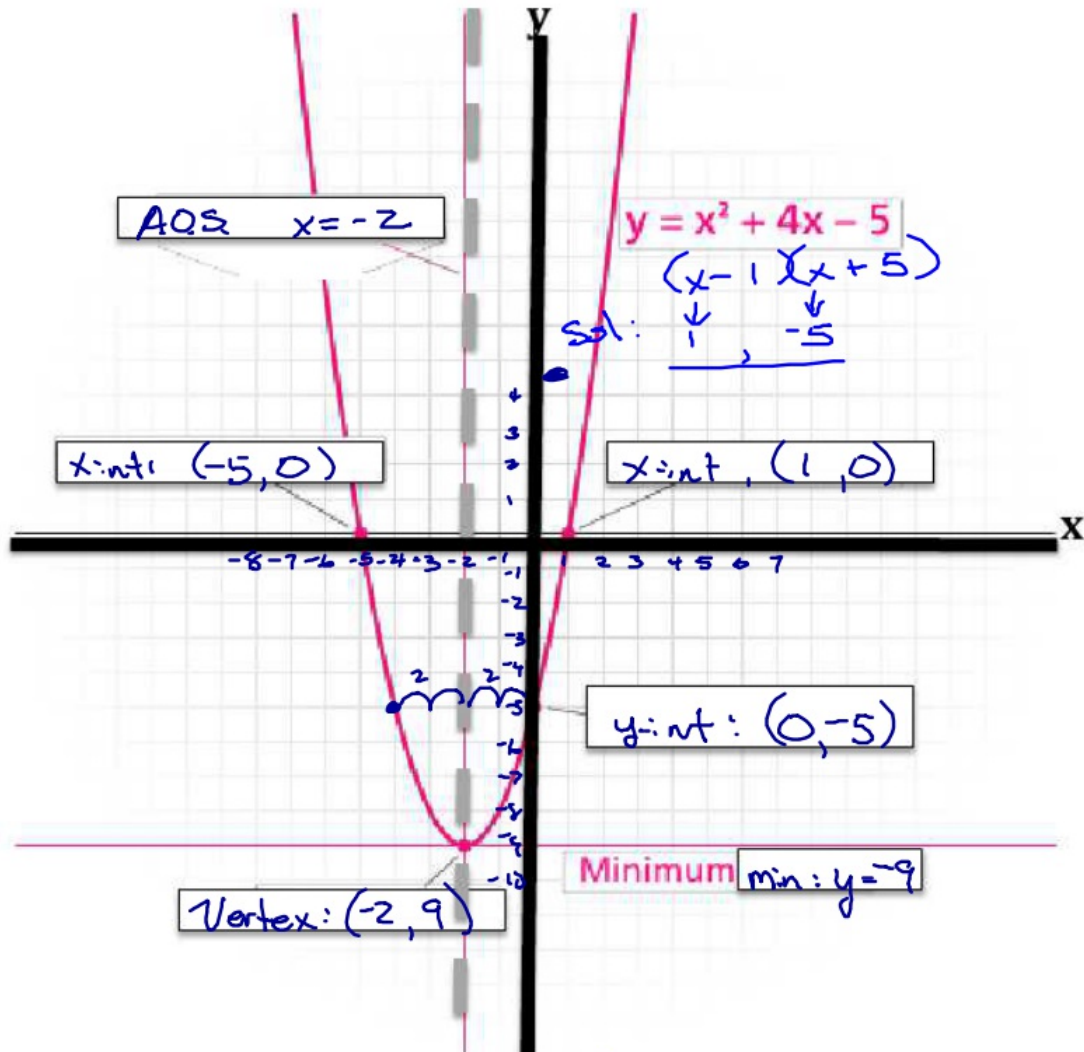
Domain is all the possible y-values of a function.

Increasing : a function is increasing when the y-value increase/up as the x-value increases from left written as an interval of numbers, example: $1 < x < 4$ or $(1, 4)$

Decreasing : a function is decreasing when the y-value decrease/down as the x-value increases from left is written as an interval of numbers, example: $x > 4$ or $(4, \infty)$

Graphing Quadratics Unit IN CLASS Day 1 NO CALCULATOR

Write the label and value of each of the following parts of the given parabola.



Where is the parabola increasing? $(-2, \infty)$

Where is the parabola decreasing? $(-\infty, -2)$

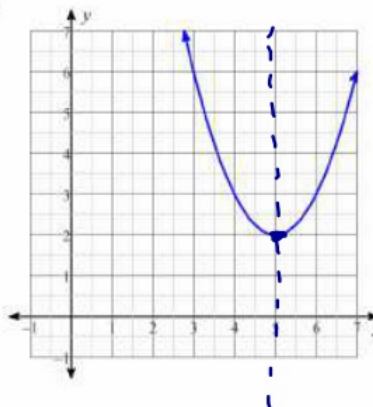
What are the coordinates for the point directly across from the y-intercept? $(-4, -5)$

What are the: domain $(-\infty, \infty)$ range $(-9, \infty)$

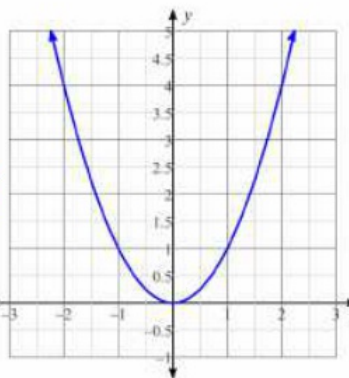
Day 1 - In Class - NO CALCULATOR!

Given each graph identify the a) vertex, b) axis of symmetry, c) x-intercept(s), d) y-intercept, e) maximum/minimum value and label as max/min, f) intervals the graph is increasing and decreasing, g) domain, and h) range. Give exact values if possible.

1)

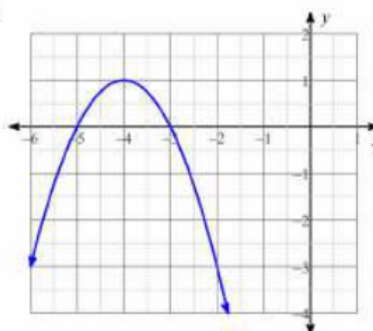


- a) $(5, 2)$ 2)
 b) $x = 5$
 c) none
 d) way up there $(0, 2)$
 e) min $y = 2$
 f) Inc. $(5, \infty)$
 Dec. $(-\infty, 5)$
 g) D: $(-\infty, \infty)$
 h) R: $(2, \infty)$

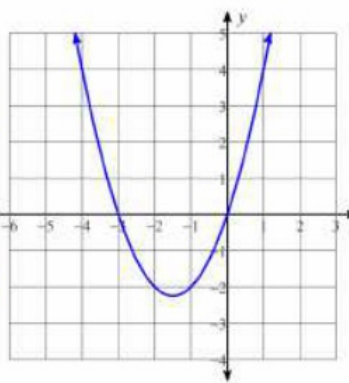


- a) $(0, 0)$
 b) $x = 0$
 c) $(0, 0)$
 d) $(0, 0)$
 e) min $y = 0$
 f) Inc. $(0, \infty)$
 Dec. $(-\infty, 0)$
 g) D: $(-\infty, \infty)$
 h) R: $(0, \infty)$

3)

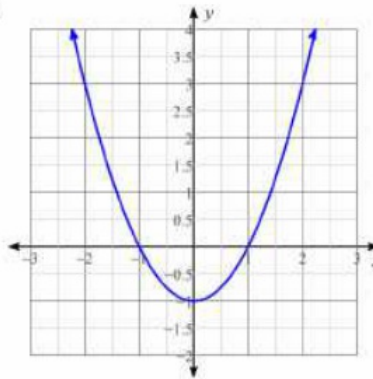


- a) $(-4, 1)$ 4)
 b) $x = -4$
 c) $(-5, 0)$ $(-3, 0)$
 d) $(0, -15)$
 e) max: $y = 1$
 f) Inc: $(-\infty, -4)$
 Dec: $(-4, \infty)$
 g) D: $(-\infty, \infty)$
 h) R: $(-\infty, 1)$

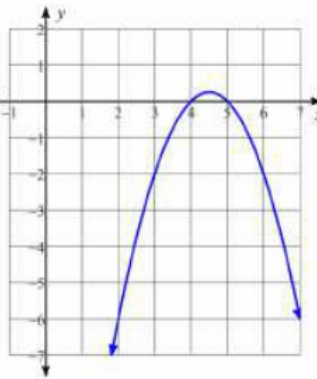


- a) $(-1.5, -2.25)$
 b) $x = -1.5$
 c) $(-3, 0)$; $(0, 0)$
 d) $(0, 0)$
 e) min: $y = -2.25$
 f) Inc: $(-1.5, \infty)$
 Dec: $(-\infty, -1.5)$
 g) D: $(-\infty, \infty)$
 h) R: $(-2.25, \infty)$

5)



- a) $(0, -1)$ 6)
 b) $x = 0$
 c) $(-1, 0)$ $(1, 0)$
 d) $(0, 0)$
 e) min $y = -1$
 f) Inc $(0, \infty)$
 Dec $(-\infty, 0)$
 g) D: $(-\infty, \infty)$
 h) R: $(-1, \infty)$



- a) $(4.5, 0.25)$
 b) $x = 4.5$
 c) $(4, 0)$ $(5, 0)$
 d) $(0, 22)$
 e) max: $y = 0.25$
 f) Inc $(-\infty, 4.5)$
 Dec $(4.5, \infty)$
 g) D: $(-\infty, \infty)$
 h) R: $(-\infty, 0.25)$