

Math-3
Lesson 4-6
Review

a) Convert to intercept form using the "Box Method"

b) What are the zeroes?

c) What are the x-intercepts?

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

$$y = x^2 + 8x + 12$$

$$y = x^2 - 36$$

Factoring Trinomials

The "Box Method"

$$y = x^2 + 5x + 4$$

(1) Factors of 4
that add up to 5

$$4 = \underline{1} * \underline{4}$$

$$5 = \underline{1} + \underline{4}$$

(2) Fill in the box

	x^2	$4x$
	x	4

(3) Factor the box

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

(4) Rewrite the equation in intercept form

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

(5) If asked by the problem, give the zeroes of the equation

$$x = -1 \text{ or } -4$$

(6) If asked by the problem, give the x-intercepts.

$$(x, y) = (-1, 0) \text{ or } (-4, 0)$$

Factoring Trinomials

The "Box Method"

$$y = 2x^2 + 13x + 15$$

(1) Multiply lead coefficient and the constant term.

$$2 * 15 = 30$$

(2) Factors of this product that add up to the coefficient of 'x'

$$30 = \underline{10} * \underline{3}$$

$$13 = \underline{10} + \underline{3}$$

(6) If asked by the problem, give the x-intercepts.

(2) Fill in the box

	$2x^2$	$10x$
	$3x$	15

(3) Factor the box

	x	5
$2x$	$2x^2$	$10x$
3	$3x$	15

(4) Rewrite the equation in intercept form

$$y = (2x + 3)(x + 5)$$

(5) If asked by the problem, give the zeroes of the equation

$$x = -\frac{2}{3} \text{ or } -5$$

$$(x, y) = \left(-\frac{2}{3}, 0\right) \text{ or } (-5, 0)$$

a) Convert to intercept form using the “Box Method”

b) What are the zeroes?

c) What are the x-intercepts?

$$y = 4x^2 + 13x - 12$$

$$y = 6x^2 + 11x + 3$$

$$y = 8x^2 - 2x - 3$$

Write example of a quadratic equation in standard form.

Without changing it to any of the other two forms, list everything you know about the graph of the function that you can derive from your equation.

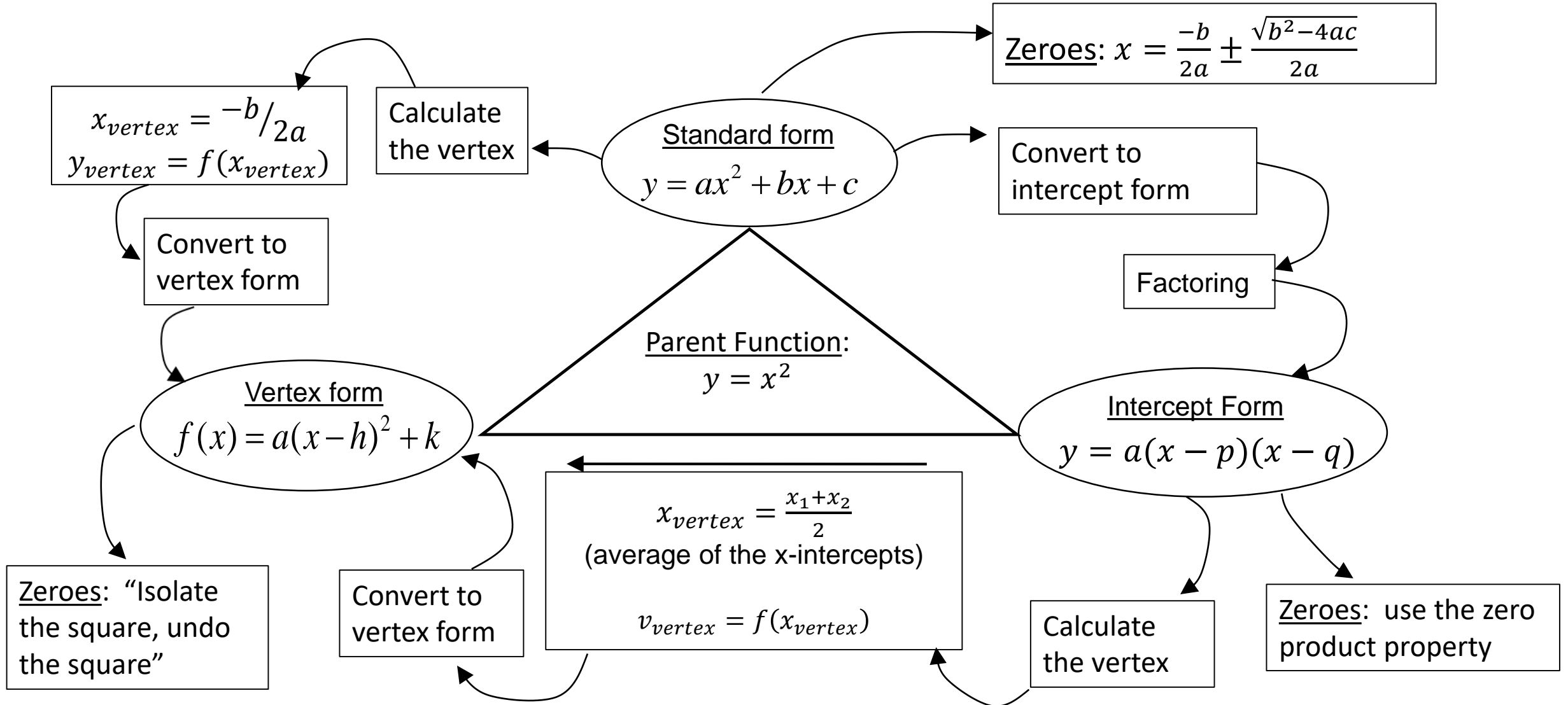
Write example of a quadratic equation in intercept form.

Without changing it to any of the other two forms, list everything you know about the graph of the function that you can derive from your equation.

Write example of a quadratic equation in vertex form.

Without changing it to any of the other two forms, list everything you know about the graph of the function that you can derive from your equation.

Forms of the Quadratic Equation



$$y = x^2 - 6x + 8$$

Calculate the vertex

Zeroes:

$x_{vertex} =$
 $y_{vertex} =$

$x =$

Convert to intercept form

Convert to vertex form

Zeroes:

Calculate the vertex

$x =$

Convert to vertex form

$x_{vertex} =$
 $y_{vertex} =$

Zeroes:

$$y = x^2 + 4x - 32$$

Calculate the vertex

Zeroes:

$x_{vertex} =$

$y_{vertex} =$

$x =$

Convert to intercept form

Convert to vertex form

Zeroes:

Calculate the vertex

Convert to vertex form

$x =$

$x_{vertex} =$

$y_{vertex} =$

Zeroes:

$$y = x^2 - 6x + 1$$

Calculate the vertex

Zeroes:

$x_{vertex} =$
 $y_{vertex} =$

$x =$

Convert to intercept form

Convert to vertex form

Zeroes:

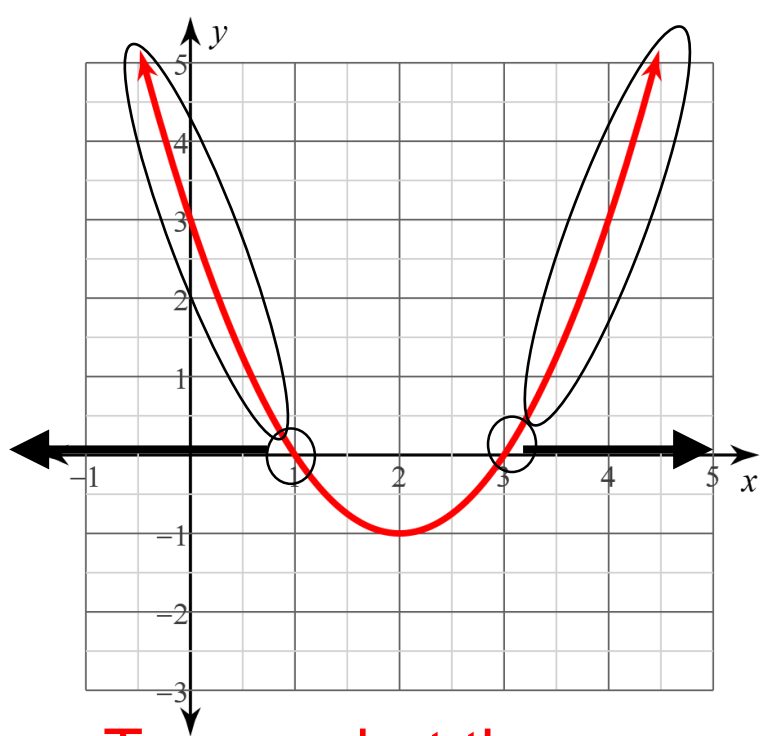
Calculate the vertex

$x =$

Convert to vertex form

$x_{vertex} =$
 $y_{vertex} =$

Zeroes:



Where is the function positive?

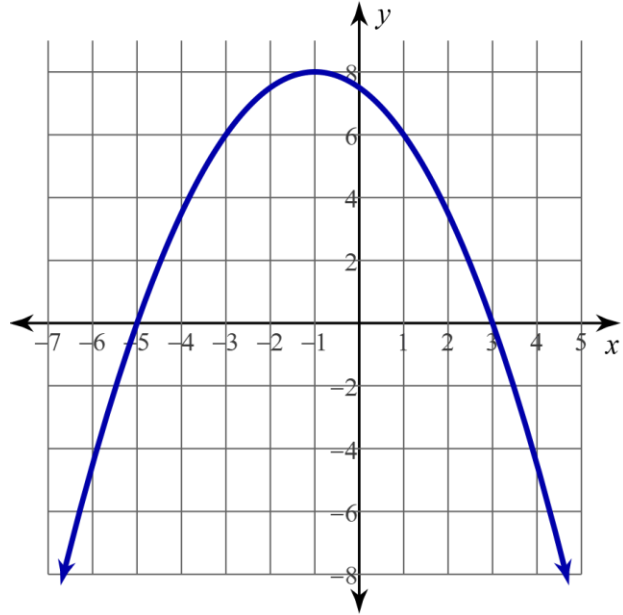
means: “What x-values have corresponding y-values that are positive?”

Or, “The graph is above the x-axis for what x-values?”

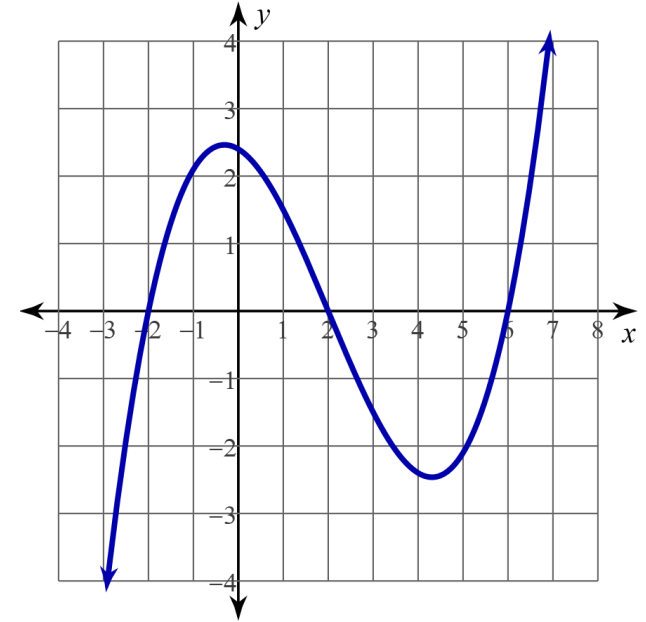
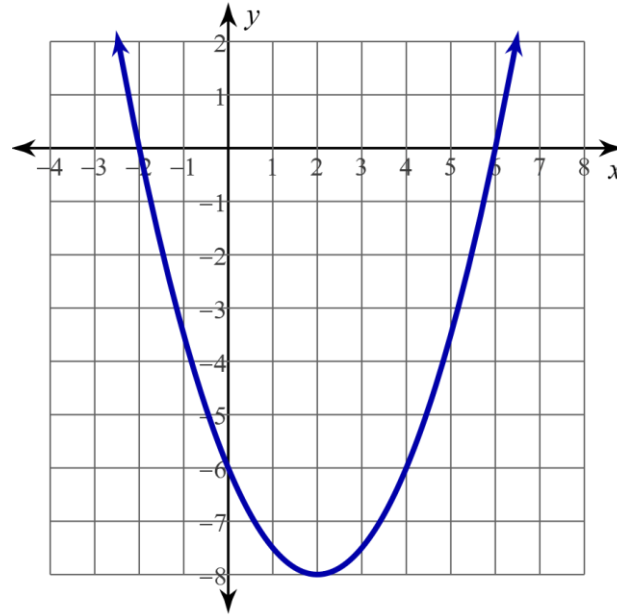
To see what these x-values are, shade the portion of the x-axis where the graph is above the x-axis.

We say: $f(x) > 0$ for $x = (-\infty, 1] \cup [3, \infty)$

Where is each function positive?



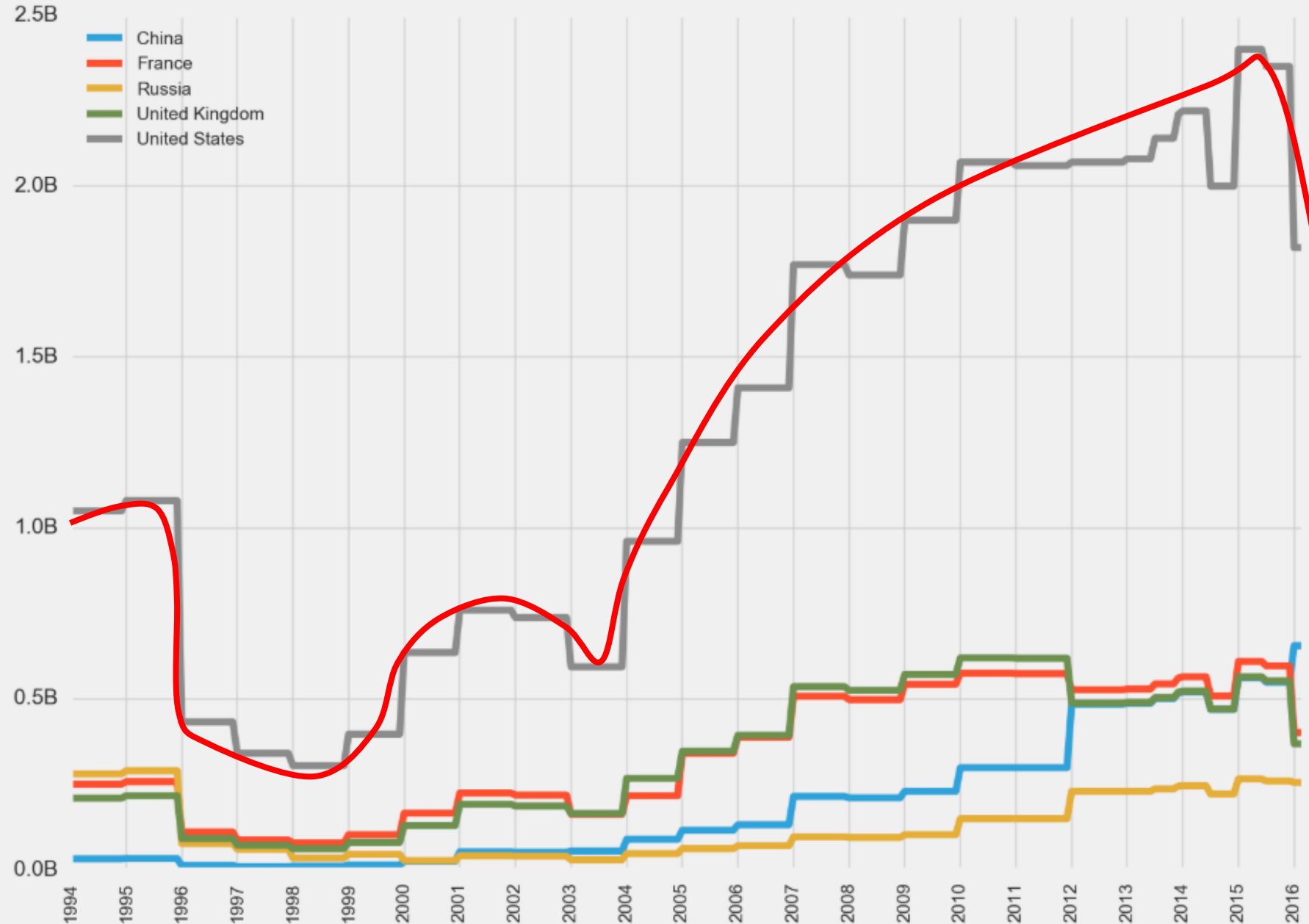
Where is each function negative?



What are the critical values for determining where the function is positive/negative?

→ x-values where the graph crosses the x-axis (or where the y-values of the points change from (-) to (+) or from (+) to (-)

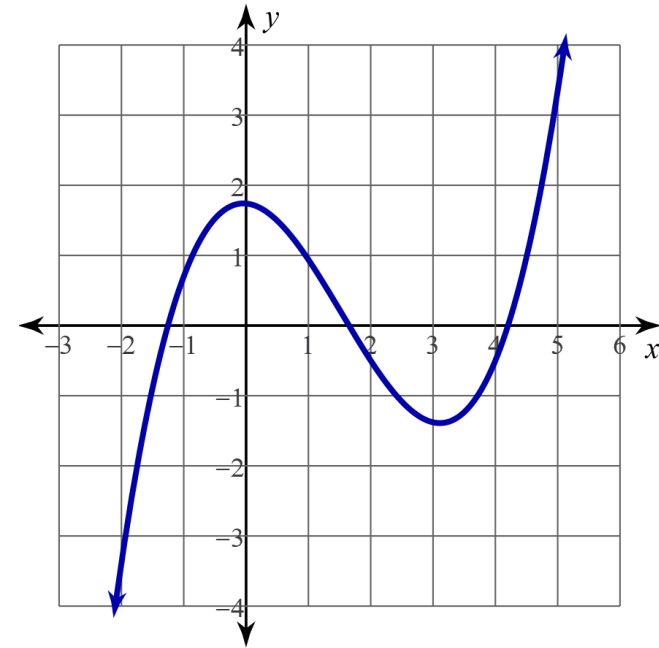
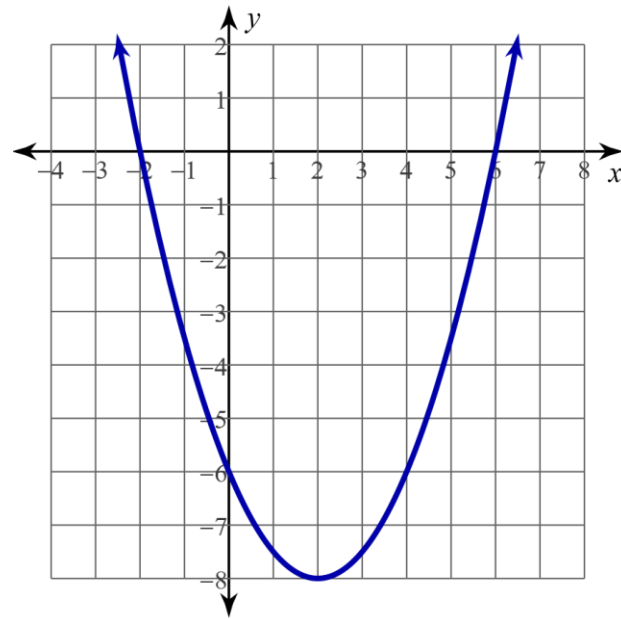
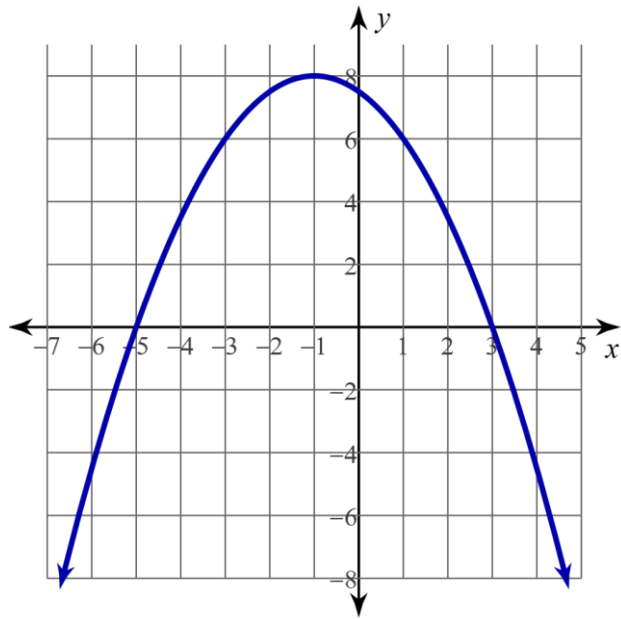
United Nations Peacekeeping Financial Contributions by the P5 (nominal \$USD) January 1994 - March 2016



During what years did the US contribution to the UN peacekeeping increase?

Where is each function increasing?

Where is each function decreasing?



What are the critical values for determining where the function is increasing/decreasing?

→ x-values of minimum or maximum function values (peaks and valleys)

Factoring Quadratic Form

$$y = x^{\textcircled{4}} + 5x^{\textcircled{2}} + 4$$

(1) It is a trinomial

(2) The largest exponent is 2 times the smaller exponent.

(3) M-substitution step.

$$\text{Let: } m = x^2$$

$$\text{Then: } m^2 = x^4$$

$$y = m^2 + 5m + 4$$

$$y = m^2 + \textcircled{5}m + \textcircled{4}$$

(4) Factors of 4 that add up to 5

The "M-Substitution Method"

$$4 = \frac{1}{\quad} * \frac{4}{\quad}$$

$$5 = \frac{1}{\quad} + \frac{4}{\quad}$$

(5) Fill in the box

	m^2	$4m$
	m	4

(6) Factor the box

	m	4
m	m^2	$4m$
1	m	4

(7) Rewrite the equation in intercept form

$$y = (m + 1)(m + 4)$$

(8) Give the zeroes of the equation

$$m = -1 \text{ or } m = -4$$

(9) Another M-substitution step.

$$x^2 = -1 \text{ or } x^2 = -4$$

(10) Solve for x

$$x = \pm i \text{ or } x = \pm 2i$$

Find the zeroes using "M-Substitution"

$$y = x^2 + 2x - 8$$

$$y = x^2 - 5x - 14$$

$$y = x^4 - 25$$

