

JEOPARDY!

**Accelerated Math IIIA
Final Review**

MATERIALS for each PAIR

- one mini whiteboard
- one whiteboard marker
- one paper towel

INSTRUCTIONS

- 1) Ms. Lee picks a student randomly.
- 2) Selected student chooses a question.
- 3) Pair discusses question and writes FINAL WORK & SOLUTION on whiteboard.
- 4) When Ms. Lee calls “TIME,” all pairs raise their whiteboards.
- 5) Pairs with the correct answer earn points.
- 6) All students jot down any necessary notes in their Math Comp Book.

HOW TO NOT LOSE POINTS...

- Follow instructions!
- Ask for hints ONLY when your pair absolutely needs one. Hints cost \$50.
- Use the whiteboards and markers only for the game and nothing else.
- Follow your partner roles.

PARTNER ROLES

- **Writer:** Writes on the whiteboard.
- **Resource Manager:** Looks through the Math Comp Book for assistance. Uses the calculator when needed.
- You and your partner must take turns alternating the two roles.

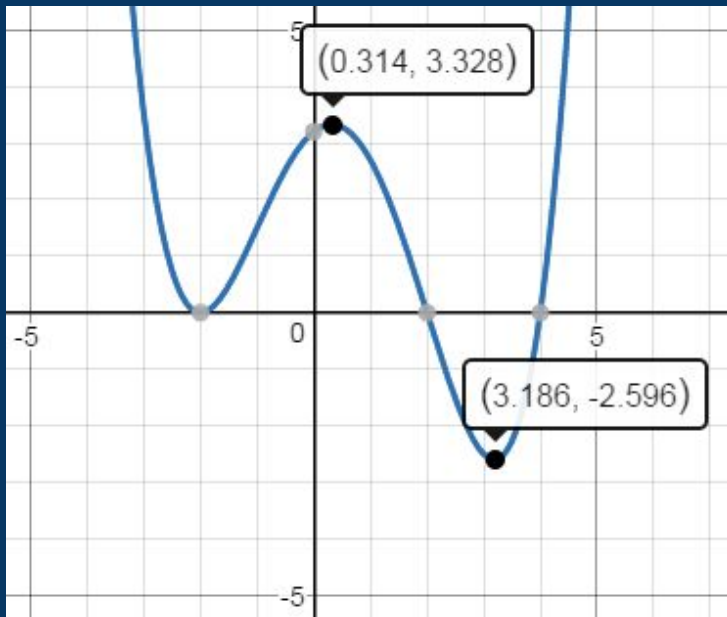
JEOPARDY BOARD

Notation	Fundamental Thrm of Algebra	Quadratics	Transform ations	Graphing Functions
\$100	\$100	\$100	\$100	\$100
\$200	\$200	\$200	\$200	\$200
\$300	\$300	\$300	\$300	\$300
\$400	\$400	\$400	\$400	\$400
\$500	\$500	\$500	\$500	\$500

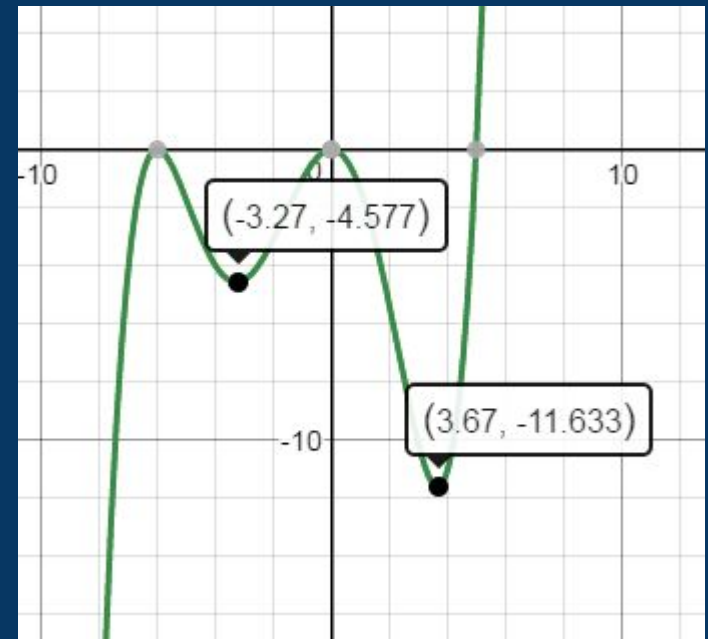
Notation - \$100

Identify the **domain** of each function.

A.



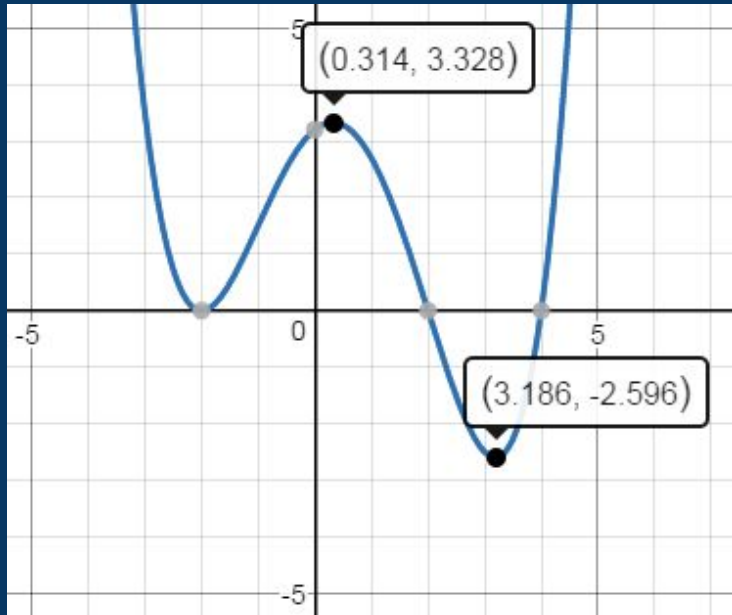
B.



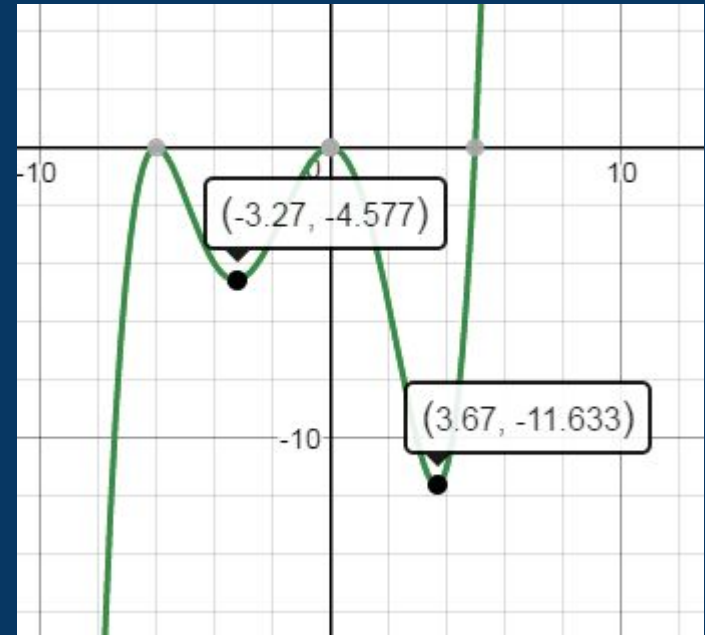
Click to see answer



Notation - \$100



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



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

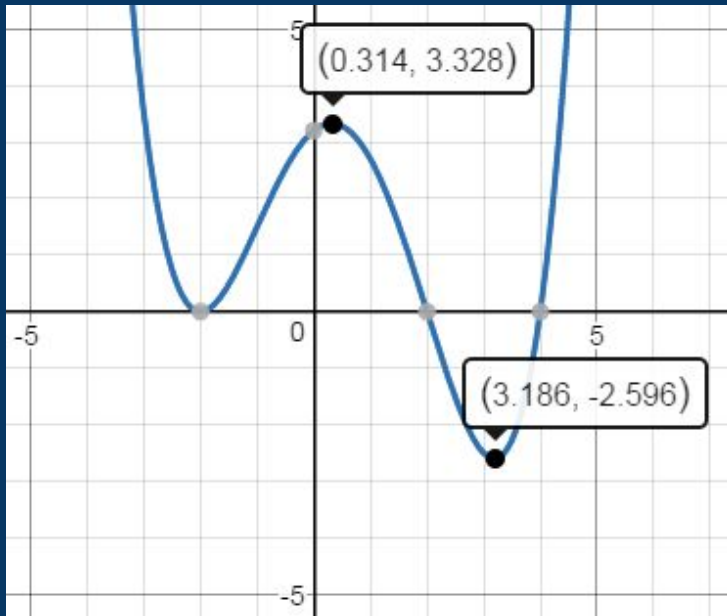
Click to return to Jeopardy Board



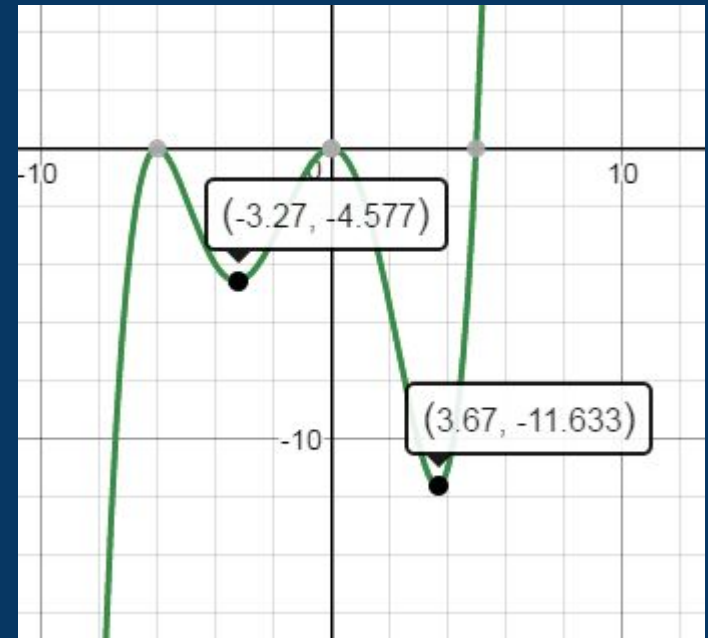
Notation - \$200

Identify the **range** of each function.

A.



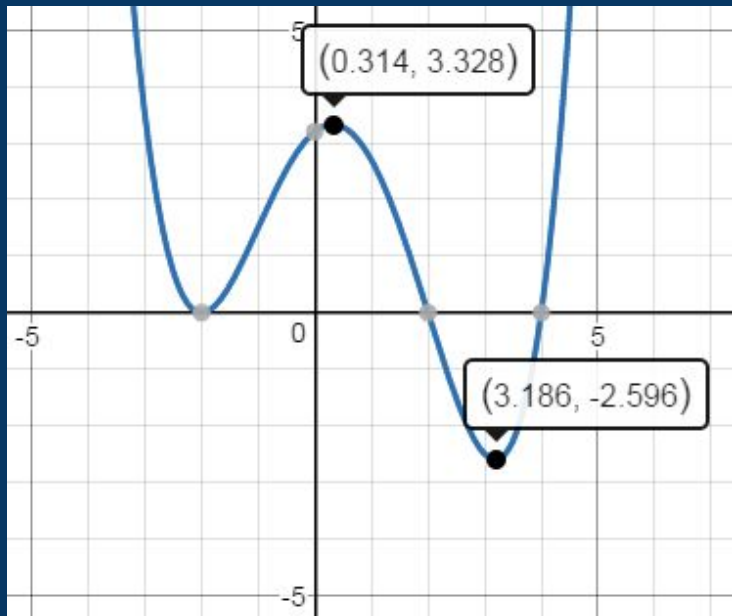
B.



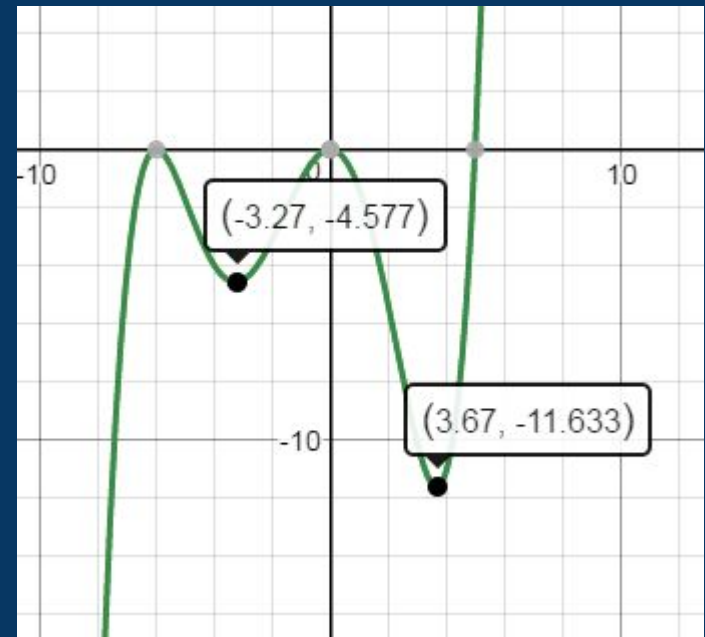
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Notation - \$200



R: $[-2.596, \infty)$



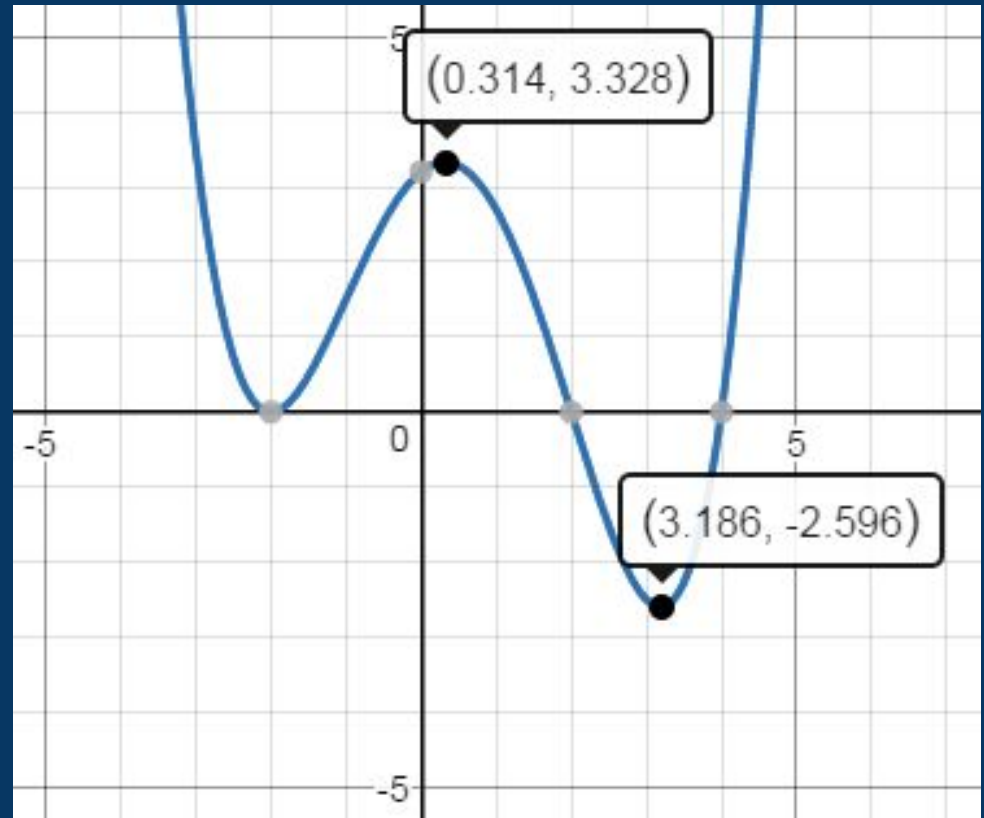
R: $(-\infty, \infty)$

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Notation - \$300

List the
intervals of
increase and
decrease.



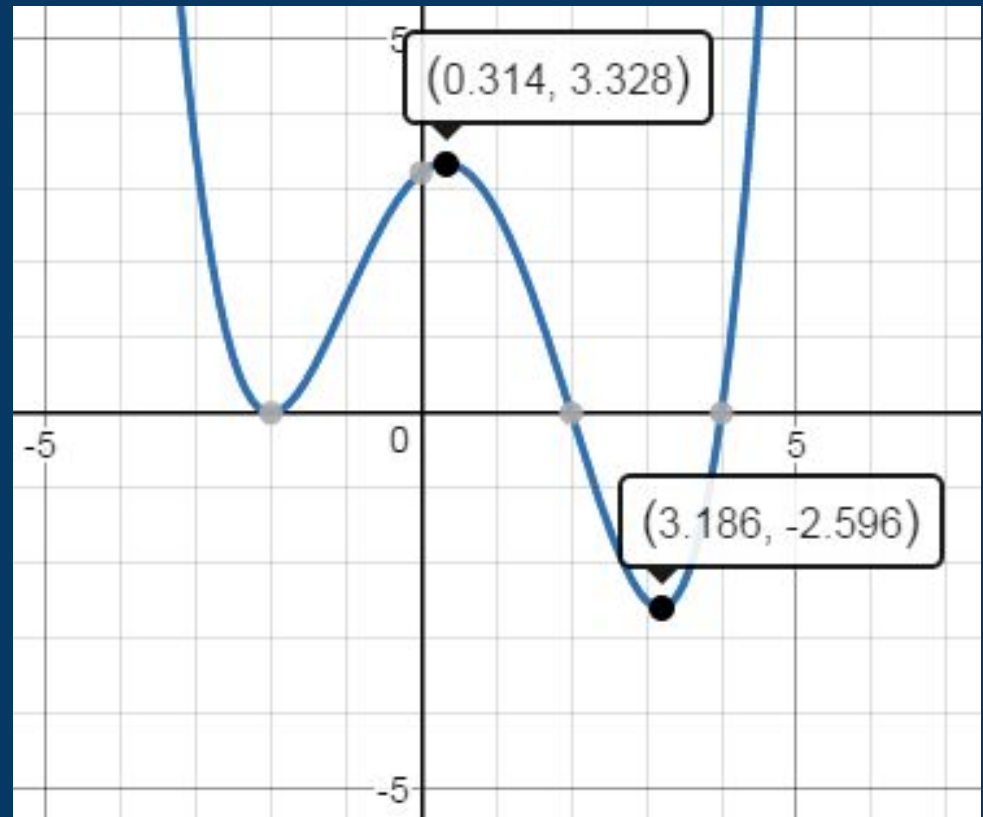
Click to see answer



Notation - \$300

Increasing on
 $(-2, 0.314)$ &
 $(3.186, \infty)$

Decreasing on
 $(-\infty, -2)$ &
 $(0.314, 3.186)$



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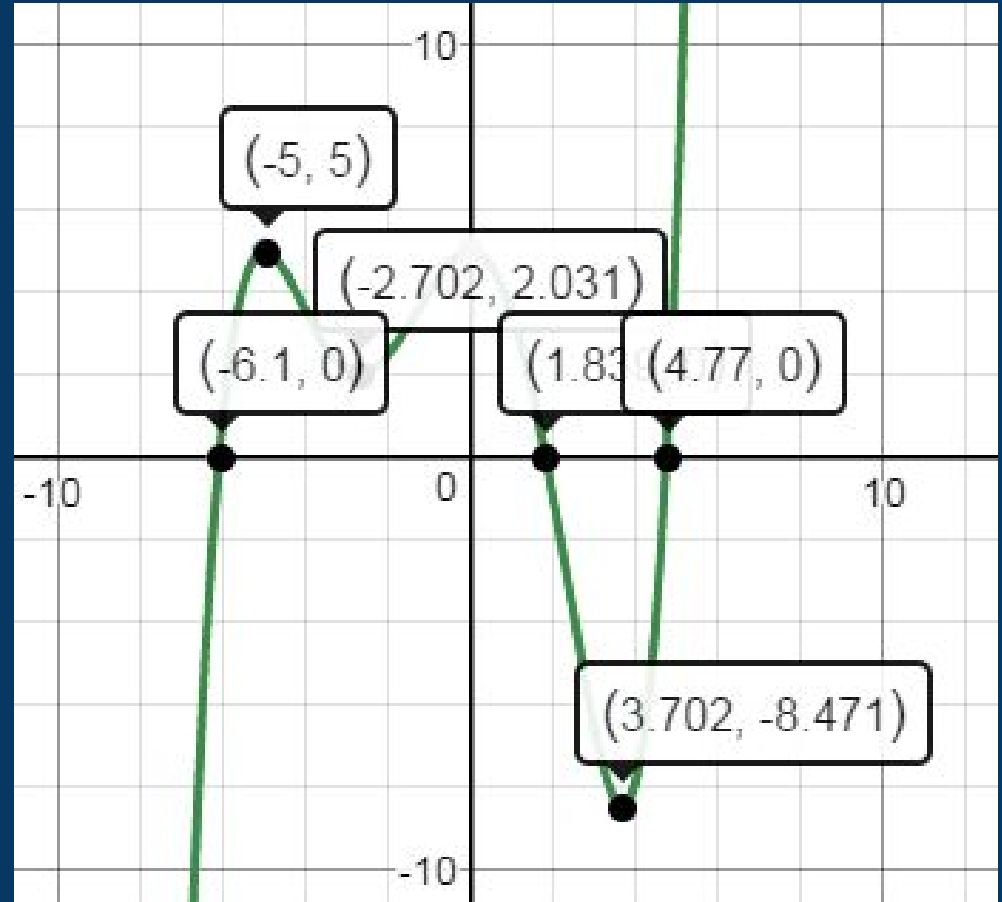


Notation - \$400

Identify
when...

$$f(x) < 0$$

$$f(x) \geq 0$$



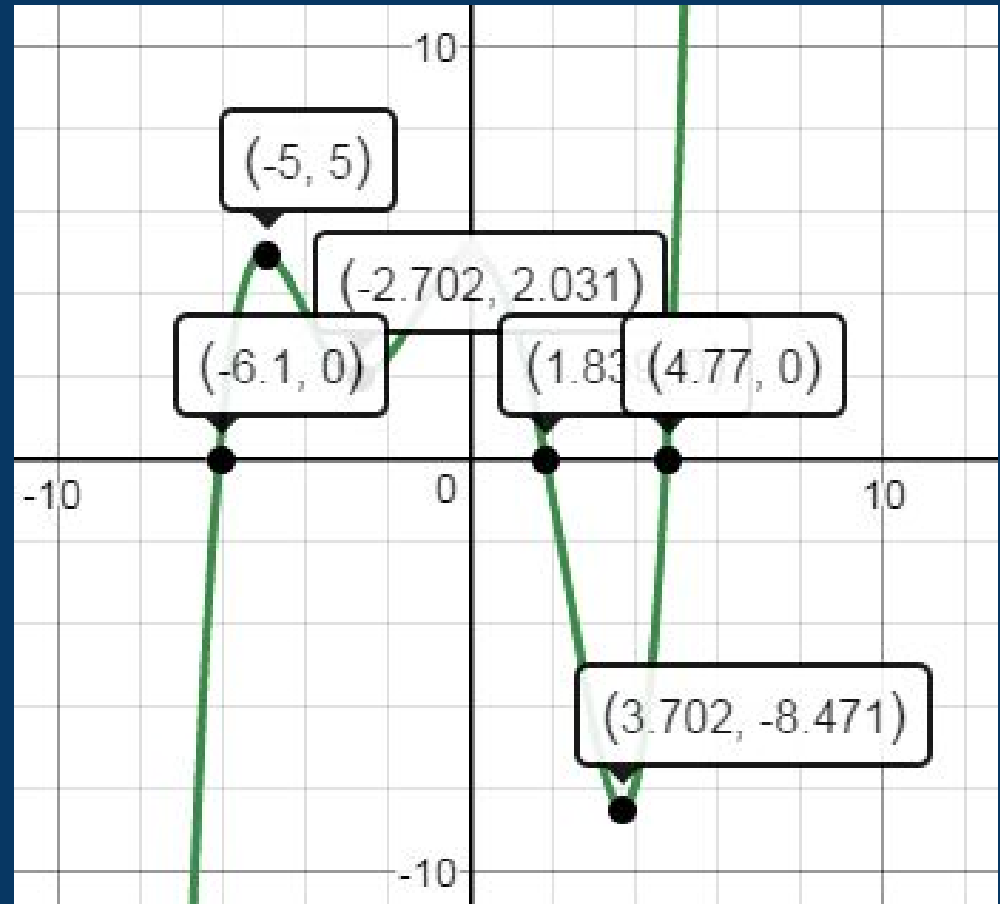
Click to see answer



Notation - \$400

$f(x) < 0$ on
 $(-\infty, -6.1)$ &
 $(1.83, 4.77)$

$f(x) \geq 0$ on
 $[-6.1, 1.83]$ &
 $[4.77, \infty)$



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Notation - \$500

Use a **sign chart** to identify when $f(x) \leq 0$ and $f(x) > 0$.

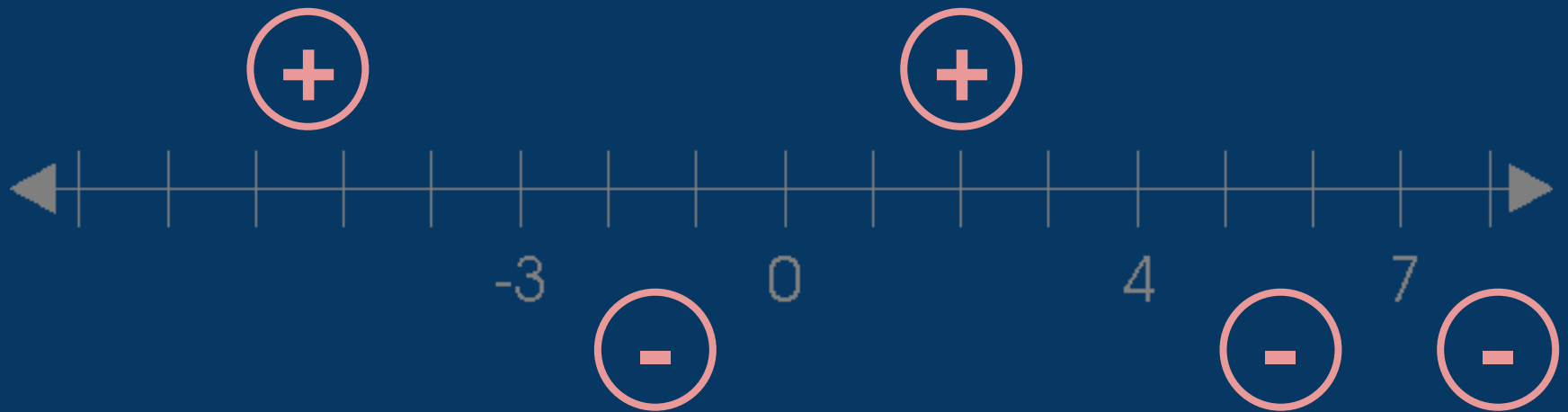
$$f(x) = -3x(x-4)(2x+6)(x-7)^2$$

Click to see answer



Notation - \$500

$$f(x) = -3x(x-4)(2x+6)(x-7)^2$$



$f(x) \leq 0$ on $[-3, 0]$ and $[4, \infty)$

$f(x) > 0$ on $(-\infty, -3)$ and $(0, 4)$

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Fundamental Thrm of Alg - \$100

Function	# of Zeros
$(-2x)^3 + 4x - 1$	
$5x^5 - 2x^2 + 4x + 3$	
$3x^4 + 6$	

Click to see answer



Fundamental Thrm of Alg - \$100

Function	# of Zeros
$(-2x)^3 + 4x - 1$	3
$5x^5 - 2x^2 + 4x + 3$	5
$3x^4 + 6$	4

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Fundamental Thrm of Alg - \$200

Function	# of Real Zeros/Roots
$(x-3)(x^2 + 16)$	
$(x^3 + 8)(x+5)^3$	
$-2x(3x+2)^2$	

Click to see answer



Fundamental Thrm of Alg - \$200

Function	# of Real Zeros/Roots
$(x-3)(x^2 + 16)$	1
$(x^3 + 8)(x+5)^3$	4
$-2x(3x+2)^2$	3

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Fundamental Thrm of Alg - \$300

Function	# of x-intercepts
$(x-3)(x^2 + 16)$	
$(x^3 + 8)(x+5)^3$	
$-2x(3x+2)^2$	

Click to see answer



Fundamental Thrm of Alg - \$300

Function	# of x-intercepts
$(x-3)(x^2 + 16)$	1
$(x^3 + 8)(x+5)^3$	2
$-2x(3x+2)^2$	2

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Fundamental Thrm of Alg - \$400

Function	Possible # of Relative Extrema
Cubic	
Quintic	
Quartic	

Click to see answer



Fundamental Thrm of Alg - \$400

Function	Possible # of Relative Extrema
Cubic	2, 0
Quintic	4, 2, 0
Quartic	3, 1

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Fundamental Thrm of Alg - \$500

Function	Possible # of Absolute Extrema
$(-2x)^3 + 4x - 1$	
$5x^5 - 2x^2 + 4x + 3$	
$3x^4 + 6$	

Click to see answer



Fundamental Thrm of Alg - \$500

Function	Possible # of Absolute Extrema
$(-2x)^3 + 4x - 1$	N/A
$5x^5 - 2x^2 + 4x + 3$	N/A
$3x^4 + 6$	1, 2

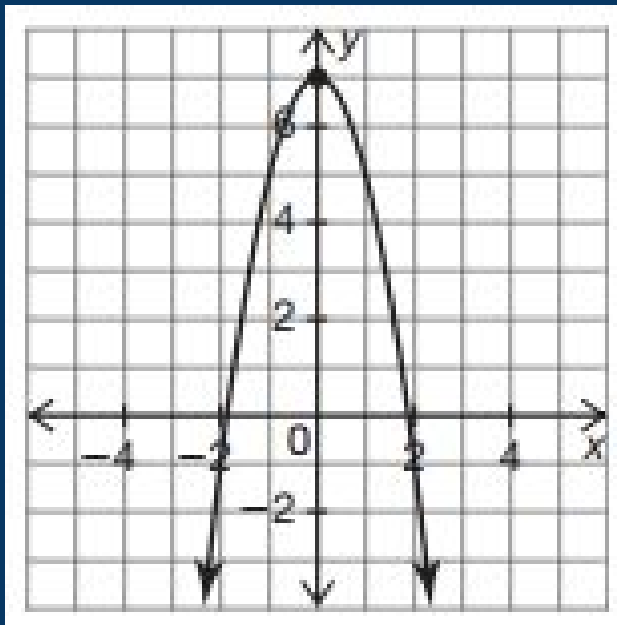
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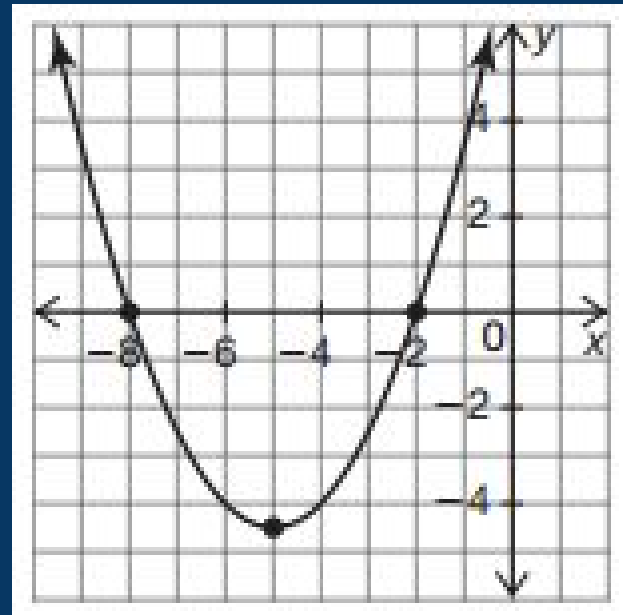
Quadratics - \$100

Describe the **symmetry** of each function.

A.



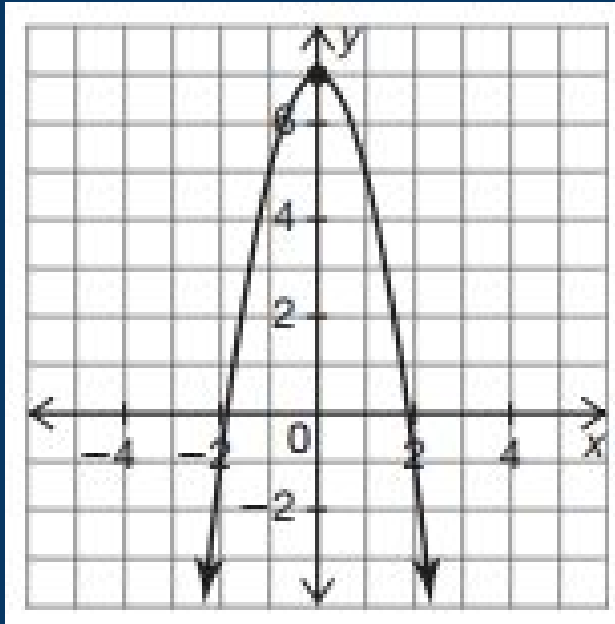
B.



Click to see answer

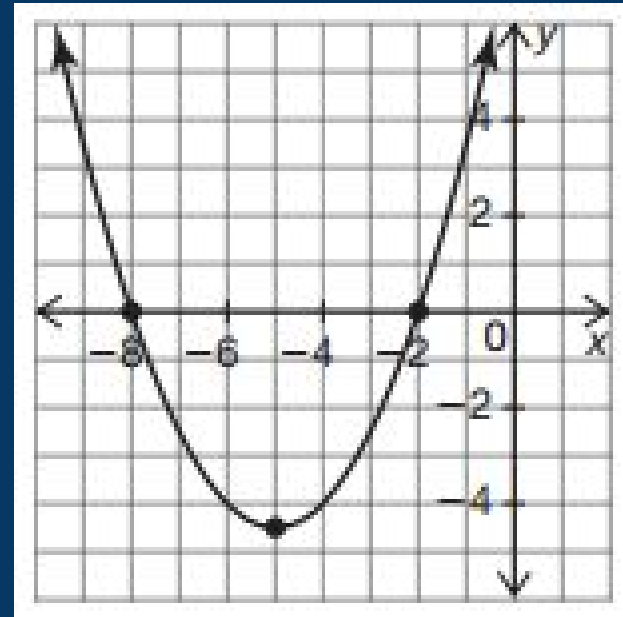


Quadratics -- \$100



EVEN

(symmetric across
the y-axis)



NEITHER

(not symmetric across
y-axis or origin)

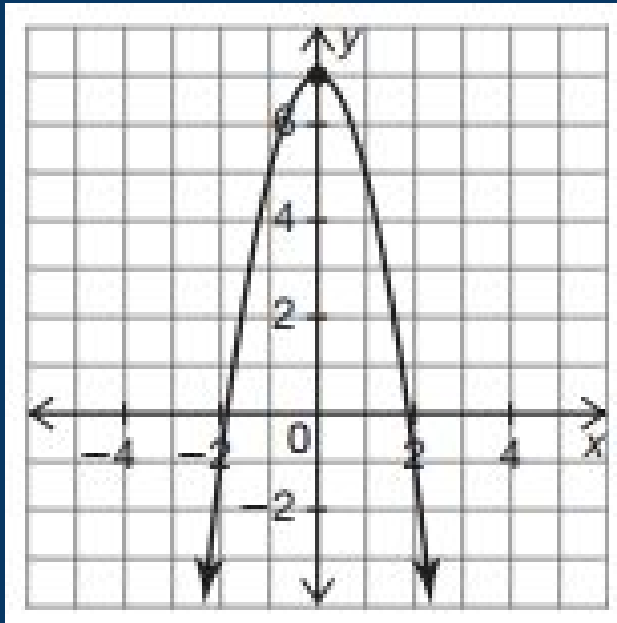
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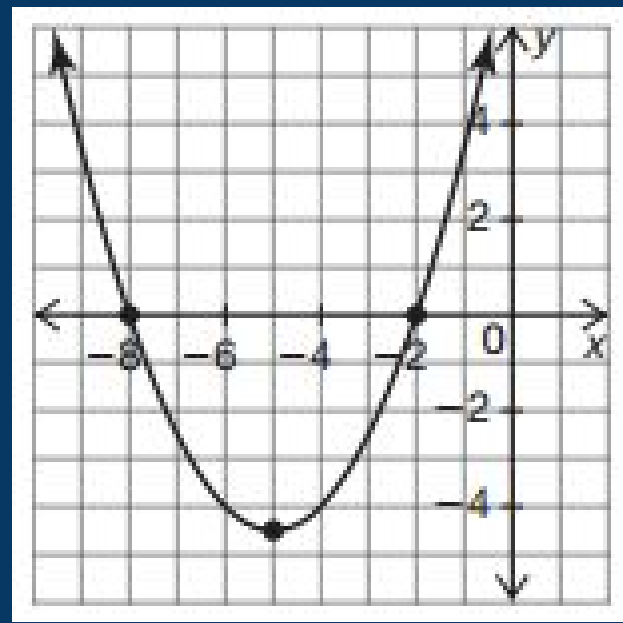
Quadratics -- \$200

Determine the **leading coefficient** of each graph.

A.



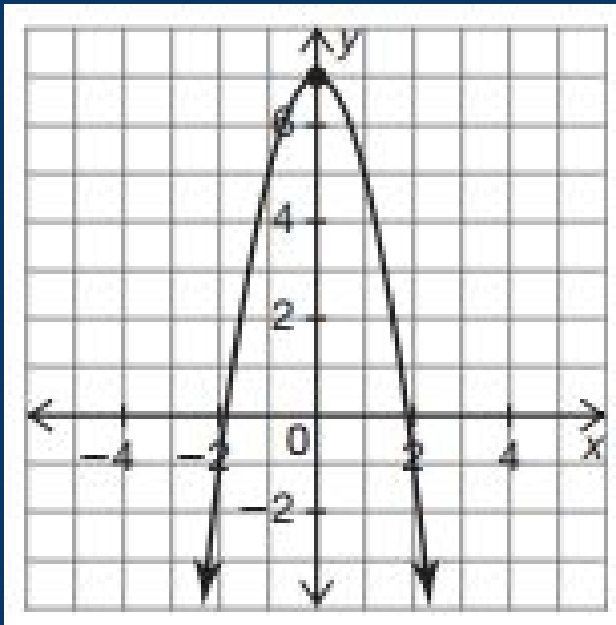
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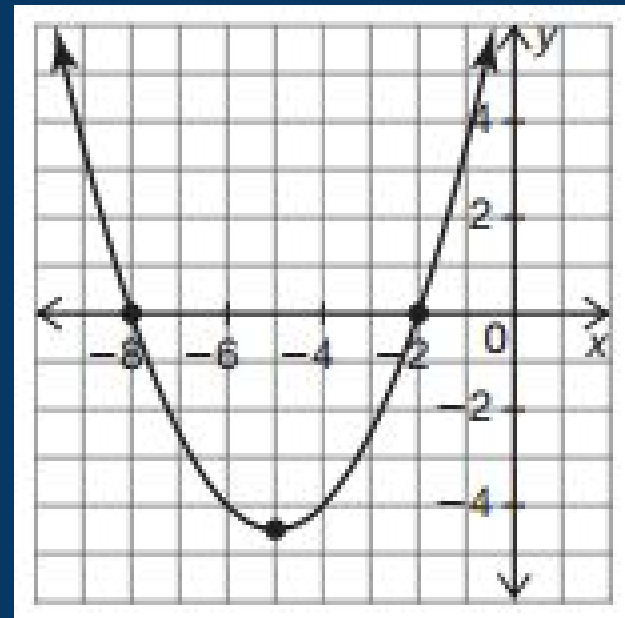
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Quadratics -- \$200



$$a = -2$$



$$a = 1/2$$

Click to return to Jeopardy Board



Quadratics - \$300

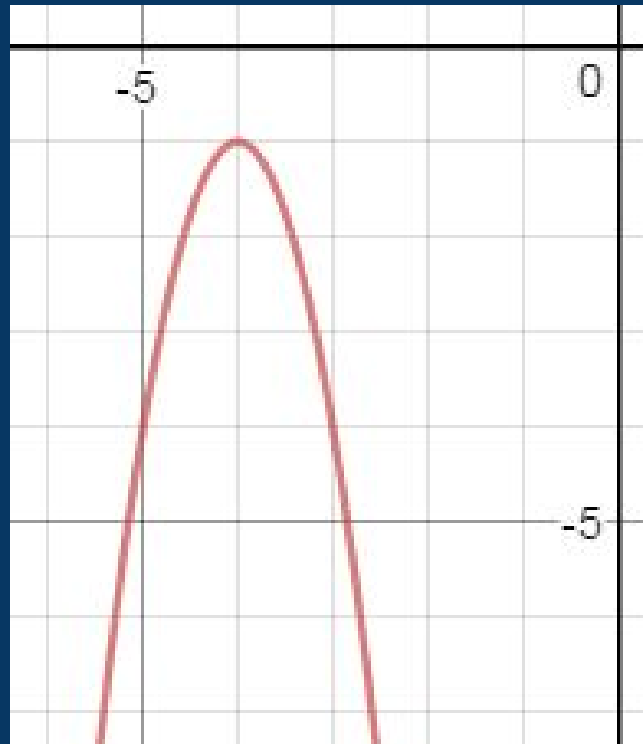
Graph $f(x) = -3(x+4)^2 - 1$

Click to see answer



Quadratics - \$300

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



Click to return to Jeopardy Board



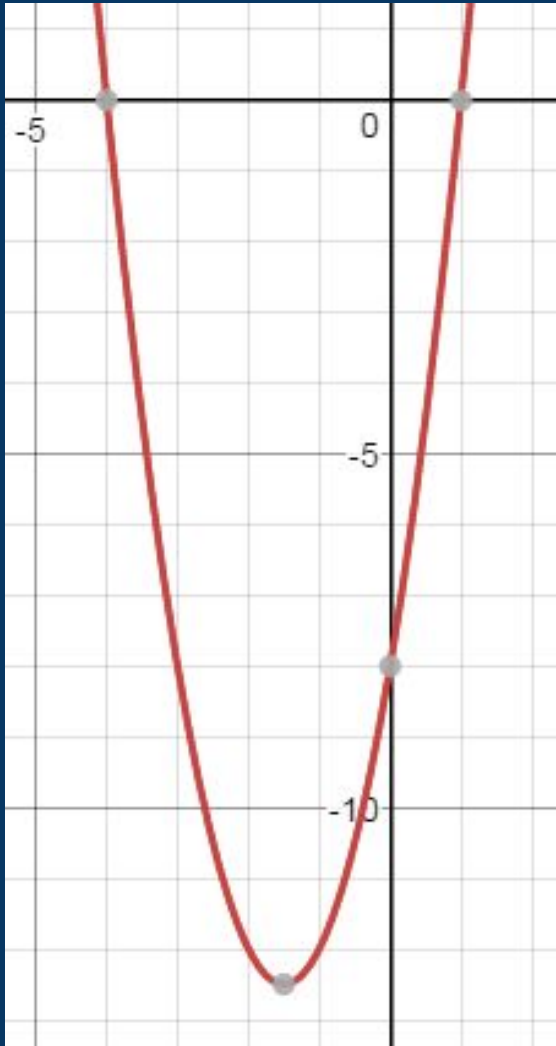
Quadratics - \$400

Graph $f(x) = 2(x+4)(x-1)$
and identify the function's
vertex and axis of symmetry.

Click to see answer



Quadratics - \$400



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

Vertex: $(-1.5, -12.5)$

Axis of Symmetry: $x = -1.5$

Click to return to Jeopardy Board



Quadratics - \$500

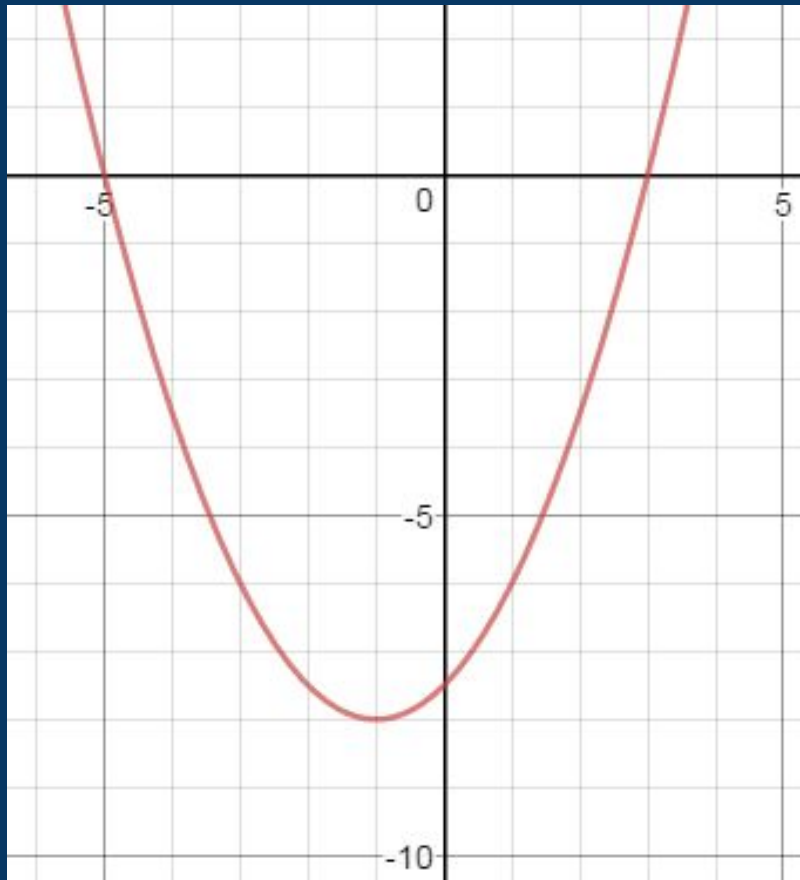
Graph $f(x) = \frac{1}{2}x^2 + x - \frac{15}{2}$
and identify the function's
vertex, axis of symmetry,
and x-intercepts.

Click to see answer



Quadratics - \$500

$$f(x) = \frac{1}{2}x^2 + x - \frac{15}{2}$$



Vertex: $(-1, -8)$

Axis of Symmetry: $x = -1$

x-Intercepts: $(-5, 0)$

$(3, 0)$

Click to return to Jeopardy Board



Transformations - \$100

What is the difference
between
rigid and **non-rigid**
transformations?

Click to see answer



Transformations - \$100

Rigid transformations change a graph while preserving its shape and size. Non-rigid transformations change a graph without preserving its shape and size.

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Transformations - \$200

Describe how to transform $f(x) = x^2$ to create the graphs of...

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

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

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

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

Click to see answer



Transformations - \$200

$g(x) = x^2 - 3$ VT down 3 units

$h(x) = x^2 + 3$ VT up 3 units

$m(x) = (x-3)^2$ HT 3 units to right

$n(x) = (x+3)^2$ HT 3 units to left



Transformations - \$300

Describe how to transform

$f(x) = |x|$ to create the
graph of $g(x) = \frac{1}{2}|x-5|$.

Click to see answer



Transformations - \$300

$$f(x) = |x| \rightarrow g(x) = \frac{1}{2} |x-5|$$

$|x-5|$: TRANSLATE $f(x)$ 5 units to the RIGHT

$\frac{1}{2} |x-5|$: VERTICAL SHRINK by a factor of $\frac{1}{2}$

Click to return to Jeopardy Board



Transformations - \$400

Describe how to transform
 $f(x) = x^2$ to create the graphs of...

$$g(x) = 2x^2$$

$$h(x) = \frac{1}{2} x^2$$

$$m(x) = (2x)^2$$

$$n(x) = (\frac{1}{2}x)^2$$

Click to see answer



Transformations - \$400

$$g(x) = 2x^2$$

V stretch by 2

$$h(x) = \frac{1}{2} x^2$$

V shrink by $\frac{1}{2}$

$$m(x) = (2x)^2$$

H shrink by $\frac{1}{2}$

$$n(x) = (\frac{1}{2}x)^2$$

H stretch by 2



Transformations - \$500

Describe each transformation (in words):

Vertical Translation

Horizontal Translation

Vertical Dilation

Horizontal Dilation

Reflection across x-axis

Reflection across y-axis

Click to see answer



Transformations - \$500

VT: add/subtract # from the function

HT: add/subtract # from the input

VD: multiply/divide # from the function

HD: multiply/divide # from the input

Reflection across x-axis: opposite of function

Reflection across y-axis: opposite of input

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Graphing Functions - \$100

Graph

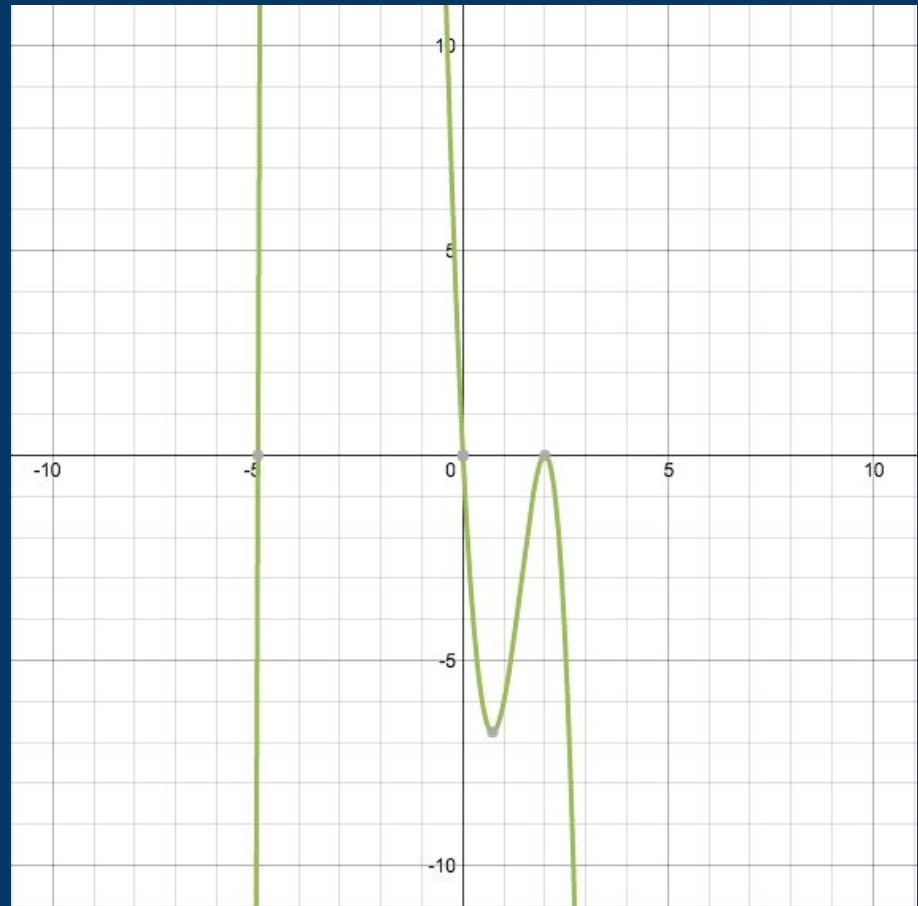
$$f(x) = -x(x-2)^2(x+5)$$

Click to see answer



Graphing Functions - \$100

$$f(x) = -x(x-2) \\ \cdot (x+5)^2$$



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Graphing Functions - \$200

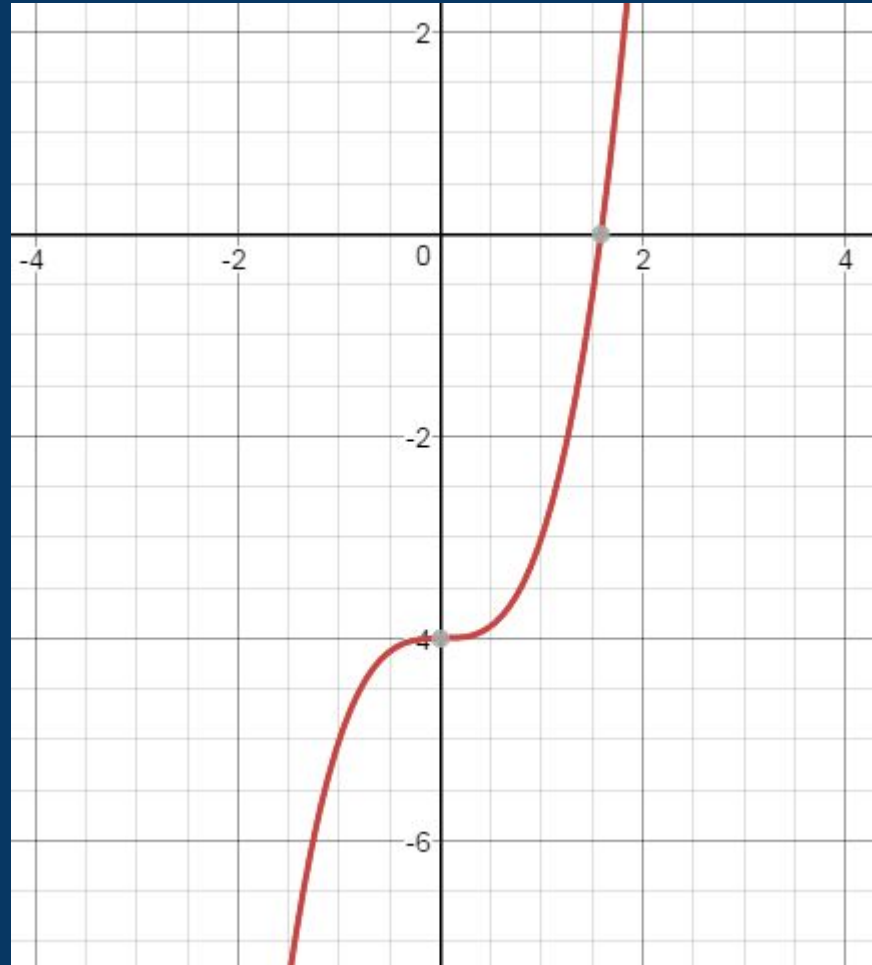
Graph $f(x) = x^3 - 4$

Click to see answer



Graphing Functions - \$200

$$f(x) = x^3 - 4$$

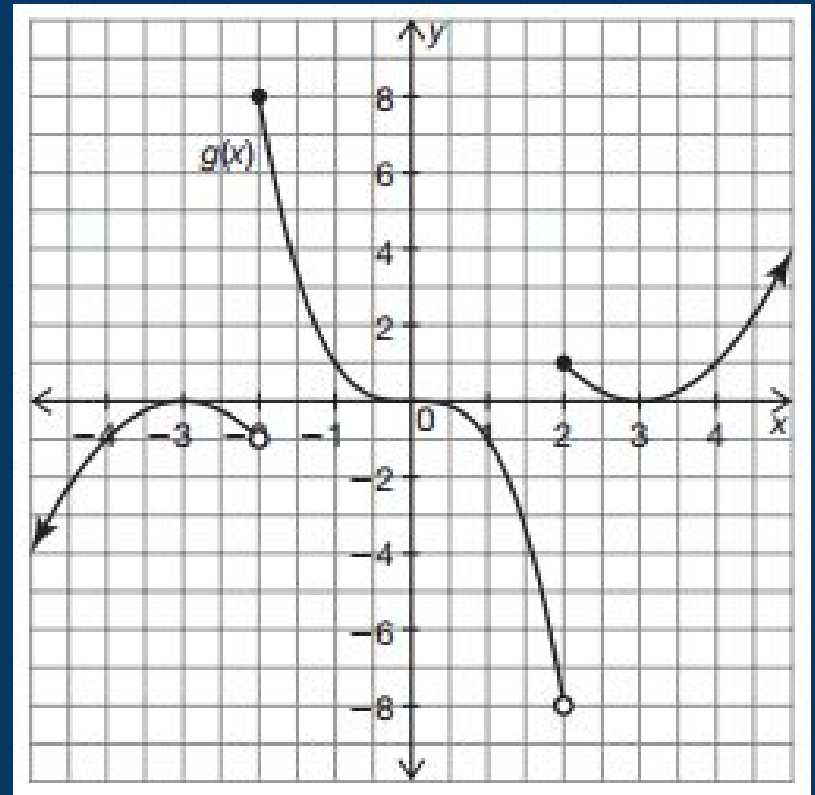


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Graphing Functions - \$300

Write a function to represent the graph shown.

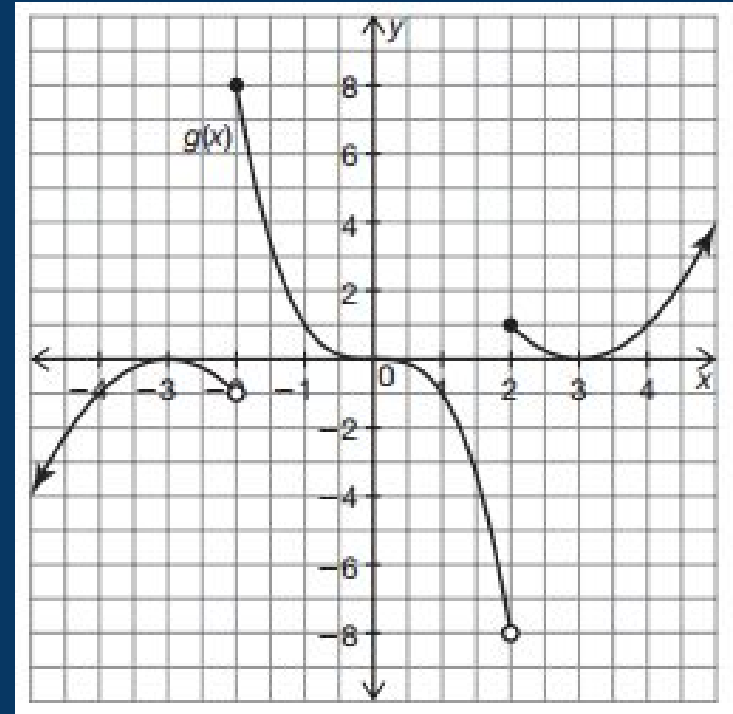


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Graphing Functions - \$300

$$g(x) = \begin{cases} -(x+3)^2, & x < -2 \\ -x^3, & -2 \leq x < 2 \\ (x-3)^2, & x \geq 2 \end{cases}$$



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Graphing Functions - \$400

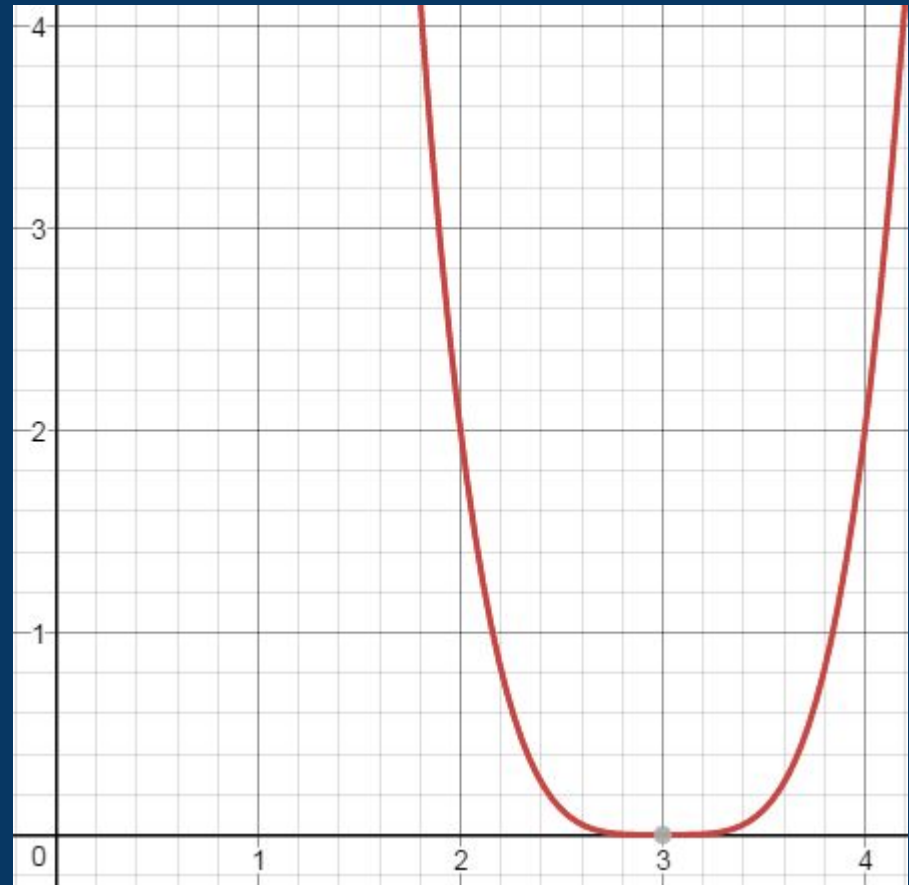
Graph $f(x) = 2(x - 3)^4$

Click to see answer



Graphing Functions - \$400

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



Click to return to Jeopardy Board



Graphing Functions - \$500

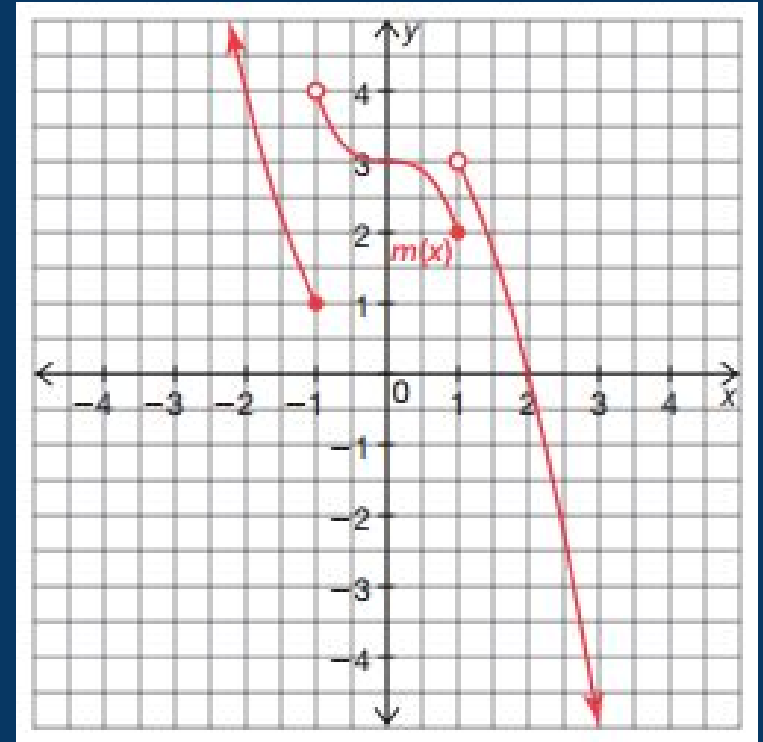
$$\text{Graph } f(x) = \begin{cases} x^2, & x \leq -1 \\ -x^3 + 3, & -1 < x \leq 1 \\ -x^2 + 4, & x > 1 \end{cases}$$

Click to see answer



Graphing Functions - \$500

$$f(x) = \begin{cases} x^2, & x \leq -1 \\ -x^3 + 3, & -1 < x \leq 1 \\ -x^2 + 4, & x > 1 \end{cases}$$



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