

Unit 1A Test Review

Find the domain of the given function.

$$1) f(x) = \frac{\sqrt{x+3}}{(x+8)(x-2)}$$

$$2) f(x) = \frac{4}{x^2}$$

$$3) f(x) = \sqrt{9-x}$$

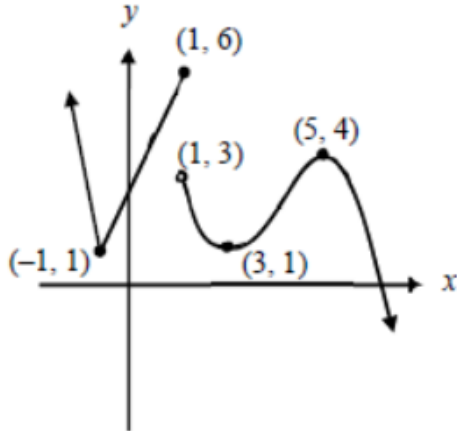
Find the range of the function.

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

$$5) f(x) = (x+5)^2 + 8$$

$$6) f(x) = \frac{13}{3-x}$$

7) Use the graph of f to estimate the local maximum and local minimum. Determine where the function is increasing and decreasing.



Find the zeros of the polynomial function and state the multiplicity of each.

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

$$9) f(x) = 3(x+8)^2(x-8)^3$$

Find the zeros of the function. (show work)

$$13) f(x) = x^3 - 49x$$

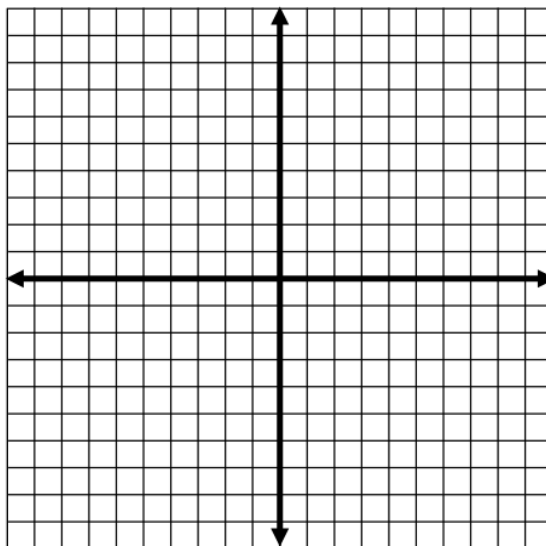
$$14) f(x) = 3x^3 - 12x^2 - 15x$$

$$15) f(x) = x^3 - 9x^2 + 8x + 60$$

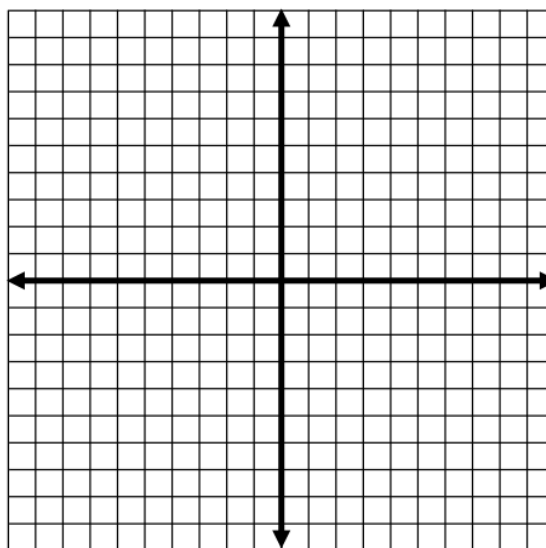
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Graph the piecewise-defined function.

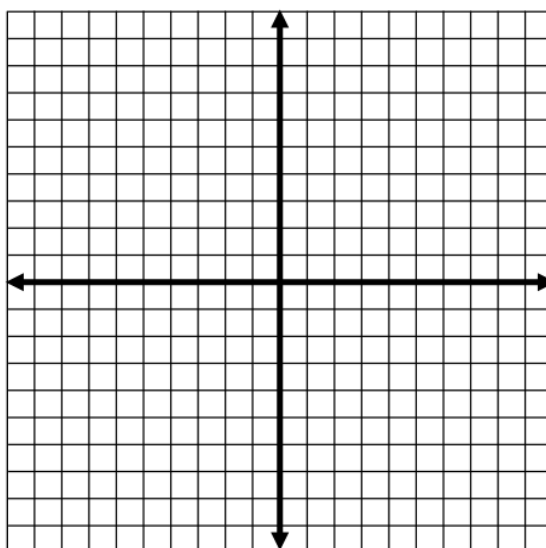
$$f(x) = \begin{cases} 2x - 2, & \text{if } x < 0 \\ -2x + 1, & \text{if } x \geq 0 \end{cases}$$



$$y(x) = \begin{cases} 9x + 8, & \text{if } x < 0 \\ x^2 - 2, & \text{if } x \geq 0 \end{cases}$$



$$f(x) = \begin{cases} x - 1 & \text{if } x \leq -2 \\ 2x - 1 & \text{if } -2 < x \leq 4 \\ -3x + 8 & \text{if } x > 4 \end{cases}$$



Unit 1A Test Review

Given $f(x) = 2x^2 - x$, find the following and simplify. $\frac{f(x+h) - f(x)}{h}$

Given $C(x) = 2x^2 - 4x + 3$, find and simplify $\frac{C(x+h) - C(x)}{h}$

Write the equation of a quadratic function that has the following transformations:

- expand horizontally by a factor of 2
- translate right 1 unit
- translate up 3 units

Write the equation of an absolute value function that has the following transformations:

- compress vertically by a factor of 3
- reflect across the x-axis
- translate right 2 units
- translate down 3 units

Describe the transformations present to the following parent functions

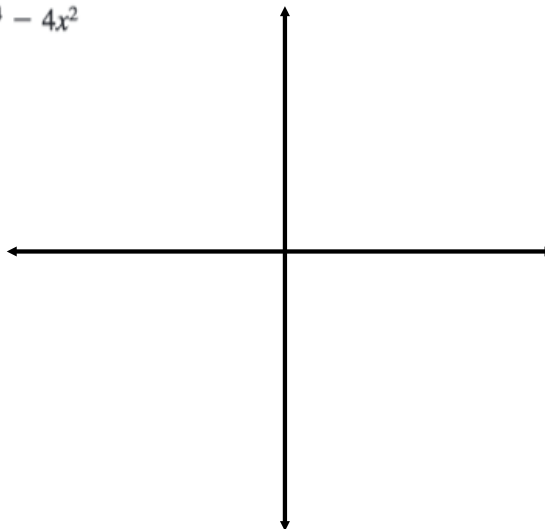
$$\underline{h}(x) = -(x - 3)^2 + 1$$

$$\underline{g}(x) = -2(x+1)^2 + 3$$

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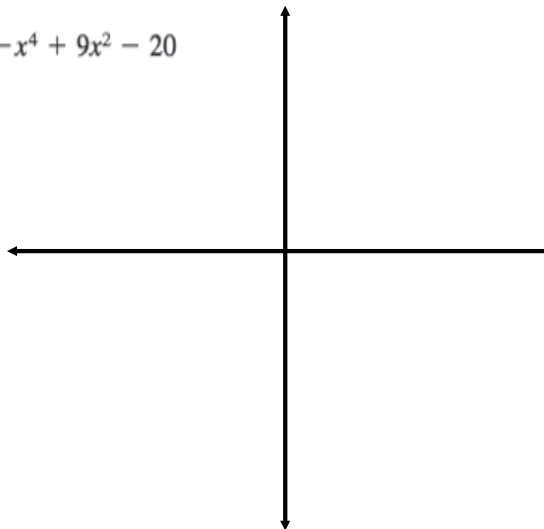
Sketch the graph of the polynomial: $g(x) = x^4 - 4x^2$

- State End Behavior
- Max # of Turns
- Factor the Polynomial to find the zeros
- Graph the polynomial



Sketch the graph of the polynomial: $f(x) = -x^4 + 9x^2 - 20$

- State End Behavior
- Max # of Turns
- Factor the Polynomial to find the zeros
- Graph the polynomial



Sketch the graph of the polynomial: $f(x) = 3x^3 + x^2 - 27x - 9$

- State End Behavior
- Max # of Turns
- Factor the Polynomial to find the zeros
- Graph the polynomial

