

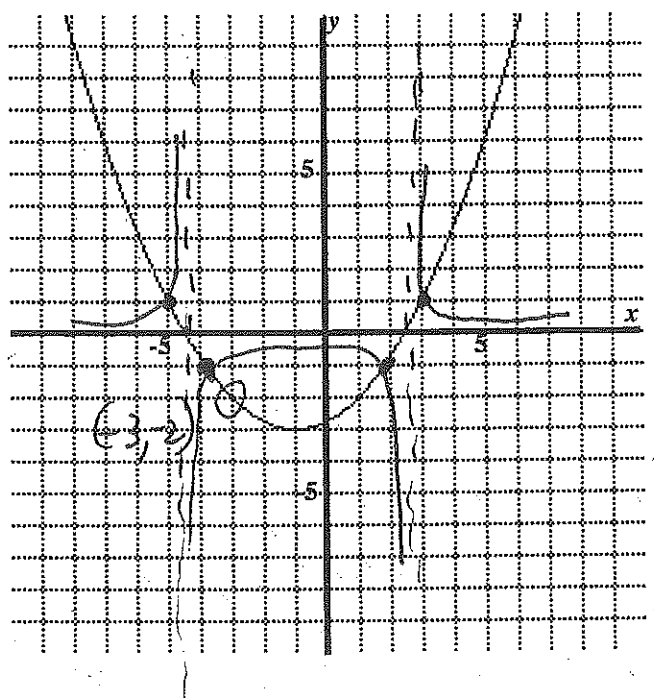
MATH 12 ASSIGNMENT #1

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**ALL YOUR WORK MUST BE SHOWN, AND THE CORRECT ANSWER
GIVEN IN ORDER TO RECEIVE FULL MARKS FOR ANY QUESTION
UNLESS OTHERWISE STATED, FINAL ANSWERS
MUST BE EXACT (NO DECIMALS) AND IN LOWEST TERMS**

1. The graph of a quadratic function $y = f(x)$ is shown on the grid to the right.



a) What is the actual quadratic equation of this parabola?

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vertex @ $(-1, -3)$

$$y = a(x+1)^2 - 3$$

$$-2 = a(-3+1)^2 - 3$$

$$-2 + 3 = 4a$$

$$a = \frac{1}{4}$$

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

b) On the same grid, draw the graph of $y = \frac{1}{f(x)}$.

$$y = \frac{1}{f(x)}$$

See graph

2

2. The graph of a polynomial function $y = g(x)$ is shown on the grid below.

a) On the same grid, draw the graph of $x = g(y)$.

See graph

b) What are the x-intercepts of $y = g(-2x)$?

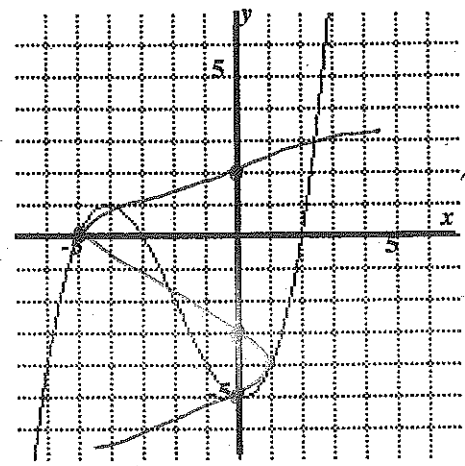
- $(-5, 0) \rightarrow \boxed{(\frac{5}{2}, 0)}$
- $(-3, 0) \rightarrow \boxed{(\frac{3}{2}, 0)}$
- $(-1, 0) \rightarrow \boxed{(-1, 0)}$

3

c) What is the y-intercept of $y = \frac{1}{g(x)}$?

$$0, 5 \rightarrow \boxed{0, \frac{1}{5}}$$

1



2

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3. Use the function $f(x) = \frac{1}{x+2} - 1$ to answer the following questions.

a) What would be the resulting equation if the following transformations happened to $y = f(x)$ in the order they are listed?

- reflected over the x -axis $f(x) = \frac{-1}{x+2} + 1$
- shifted 3 units left and 1 unit up $f(x) = \frac{-1}{x+5} + 2$
- reflected over the y -axis

3

$$f(x) = \frac{-1}{-x+5} + 2$$

$$= \frac{+1}{+(x-5)} + 2$$

Simplified form

$$= \frac{1}{x-5} + 2$$

b) What is the actual equation of $y = f^{-1}(x)$?

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

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

$$x+1 = \frac{1}{y+2}$$

$$\frac{1}{x+1} = y+2$$

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

4. The graph of a function $y = g(x)$ is shown on the grid below. $g(x) = -|x+2| - 3$

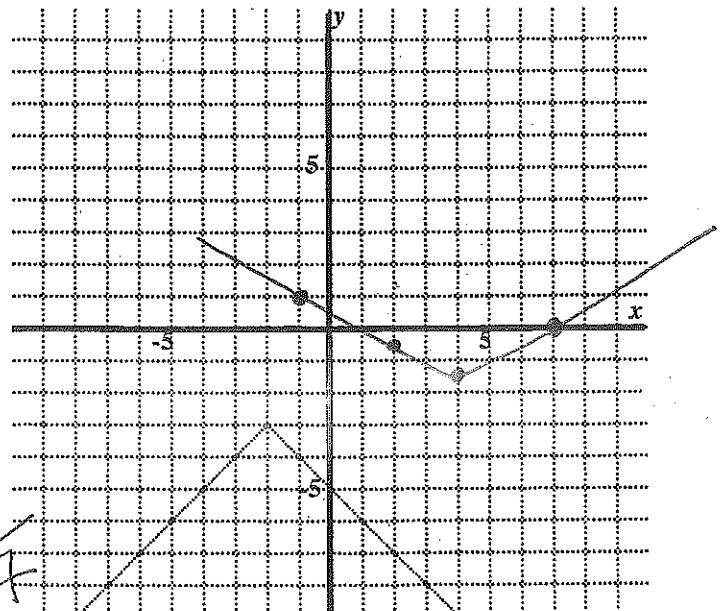
a) On the same grid, sketch the graph of

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

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

$$(x, y) \rightarrow (-x+2, -\frac{y}{2} - 3)$$



b) What other transformation on $y = g(x)$ would produce an identical graph as the transformation $y = g(-x)$?

$g(-x)$ moves the vertex point from $(-2, -3)$ to $(2, -3)$ through reflection on the y -axis. A horizontal translation 4 units right would also do this.

∴ $g(x-4)$ produces the same graph as $g(-x)$.

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