

Name: _____

Student #: _____

Date: _____

T.A. #: _____

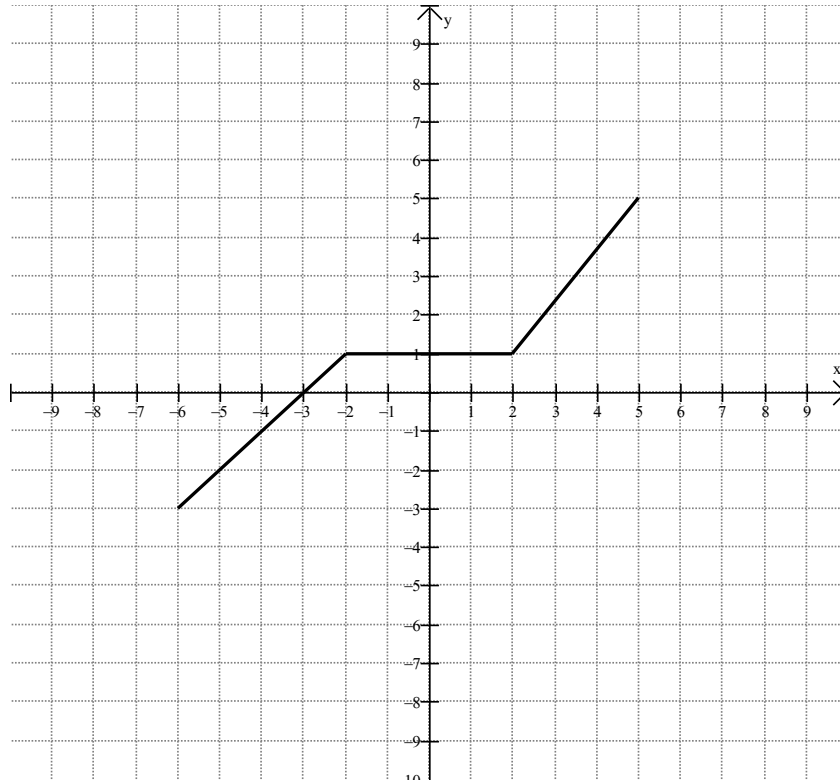
**Mathematics 12 Pre-Calculus
LEARNING GUIDE 2 TEST – TRANSFORMATIONS**

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***Full marks may NOT be given for the final answer only.**

When using a calculator, you should provide a decimal answer that is correct **to at least two decimal places** (unless otherwise indicated). Such rounding should occur **only** in the final step of the solution.

1. Using the graph of $y = f(x)$ below, sketch and label the graphs of: (2 marks)
 - a) $f(x - 1) - 1$
 - b) $f(-2x)$



2. Give the location of any invariant point(s) in the transformations you did in #1b. (1 mark)

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3. Describe what happens to the graph of a function if you make each change to its equation:

(2 marks each)

a) replace y with $-y$, then replace x with $x - 4$.

b) replace x with $x + 1$ and y with $y + 5$.

c) replace x with $2x$ and y with $\frac{1}{3}y$.

d) replace x with $-\frac{1}{2}x$ and y with $3y$, then y with $y + 1$

4. Describe what happens to the equation of a function if you make each change to its graph:

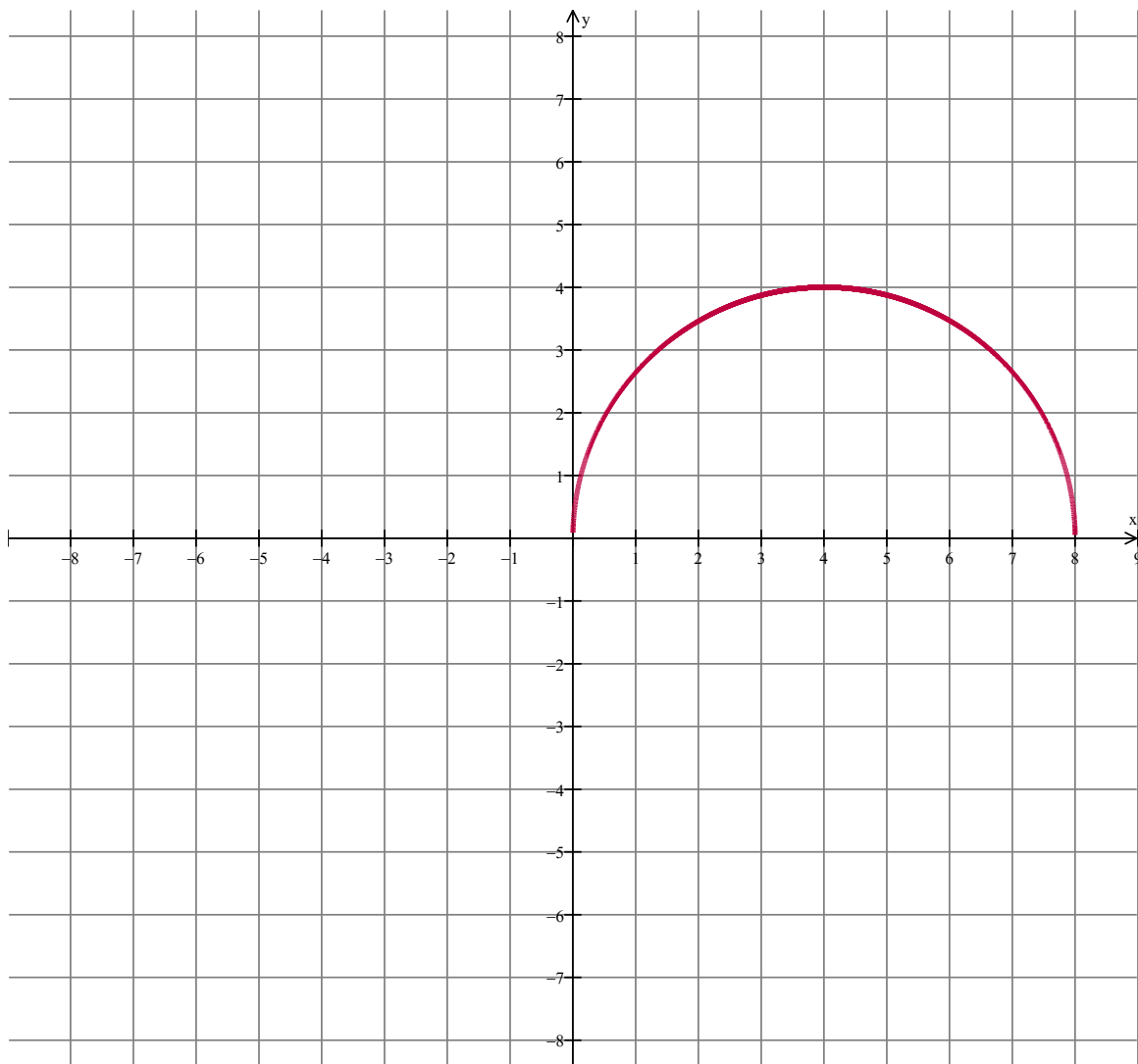
(2 marks each)

a) reflect the graph about the line $y = x$.

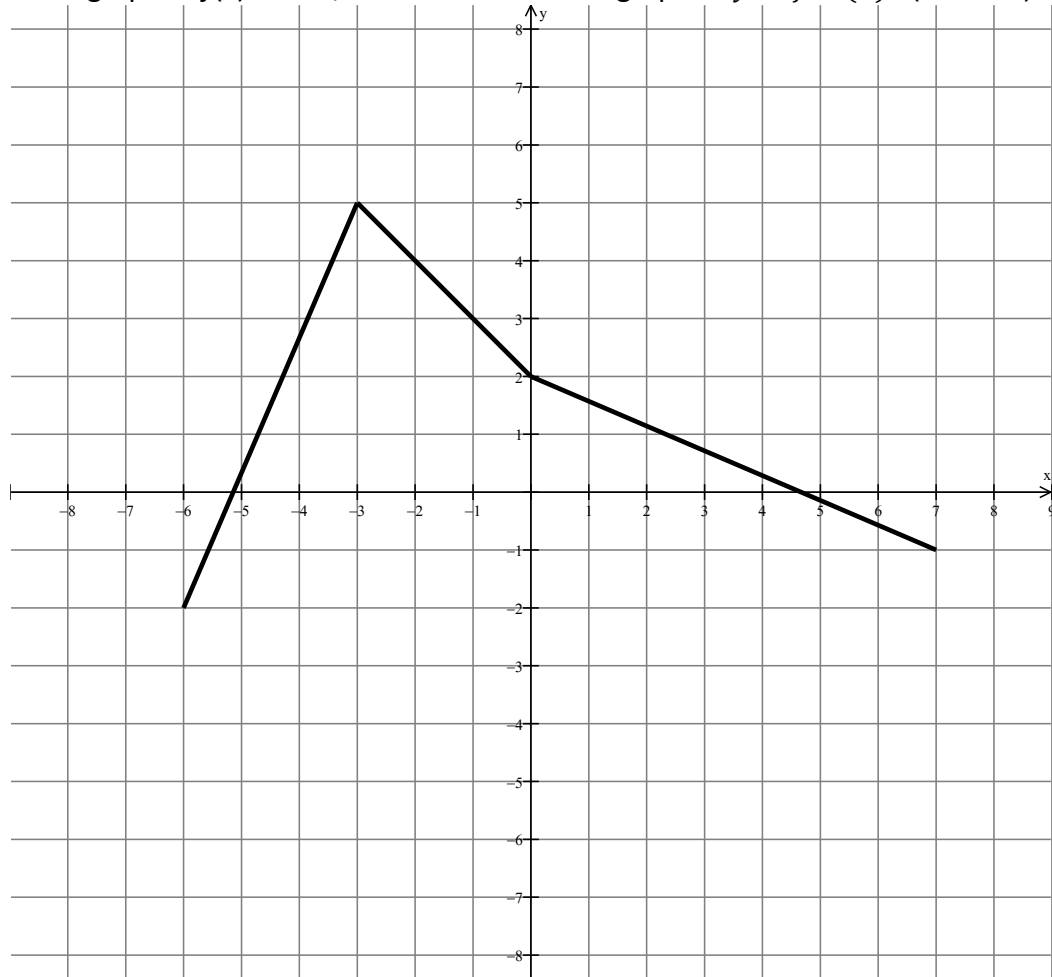
b) stretch (expand) vertically by a factor of 3 and then move down 3.

c) stretch (compress) vertically by a factor of $\frac{1}{5}$ and translate 2 units right.

5. Given the graph of $y = f(x)$, sketch the graph of $y = f(-2x) + 3$. (2 marks)



6. a) Given the graph of $f(x)$ below, sketch and label the graph of $y = f^{-1}(x)$. (3 marks)



b) How do you tell by looking at the graph of $f(x)$ that the inverse will not be a function? (1 mark)

c) How could you restrict the domain of $f(x)$ so that the inverse would be a function? (1 mark)

7. What is the inverse of the relation $y = \frac{x-2}{3}$?

(2 marks)

8. If $(-6, 3)$ is a point on the graph of $y = f(x)$, what must be a point on the graph of $y = 2f(-x) - 1$?

(2 marks)

9. Give the equation of the new relation if the graph of $y = x^2 - x + 1$ were stretched (expanded) vertically by a factor of 2, stretched (compressed) horizontal by a factor of $\frac{1}{2}$ and moved down 1. (2 marks)