

Lesson 29 – Transformations of Functions – Day 3

(A) Lesson Objective:

- a. consolidate understanding of function transformations using technology → GSP

(B) Link to GSP Files:

- a. \\Server17\stures\$\High School\Mathematics → **Transformations with slidersv4**
- b. Option 2: <http://www.geogebraTube.org/student/m708>
- c. Option 3: <http://www.geogebraTube.org/student/m2702>

(C) Investigations/Consolidations to Complete → PART A: REVIEW

- a. Investigate/Review the effect of “ a ” in the equation $q(x) = a \cdot h(b \cdot (x + c)) + d$
 - i. Use the slider to change the value of “ a ” → describe what happens to the function as “ a ” changes (include some numbers in your answer). Reset “ a ” to 1 now that you are done

- b. Investigate/Review the effect of “ b ” in the equation $q(x) = a \cdot h(b \cdot (x + c)) + d$
 - i. Use the slider to change the value of “ b ” → describe what happens to the function as “ b ” changes (include some numbers in your answer). Reset “ b ” to 1 now that you are done

- c. Investigate/Review the effect of “ c ” in the equation $q(x) = a \cdot h(b \cdot (x + c)) + d$
 - i. Use the slider to change the value of “ c ” → describe what happens to the function as “ c ” changes (include some numbers in your answer). Reset “ c ” to 0 now that you are done

- d. Investigate/Review the effect of “ d ” in the equation $q(x) = a \cdot h(b \cdot (x + c)) + d$
 - i. a Use the slider to change the value of “ d ” → describe what happens to the function as “ d ” changes (include some numbers in your answer). Reset “ d ” to 0 now that you are done

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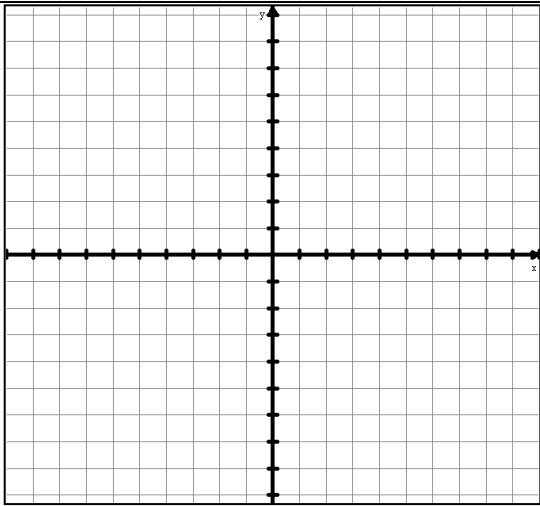
(D) Investigations/Consolidations to Complete → PART B: Multiple Transformations

- a. Prepare graphs using GSP given the following multiple transformations. Describe the changes in words and then include a copy of the diagram.

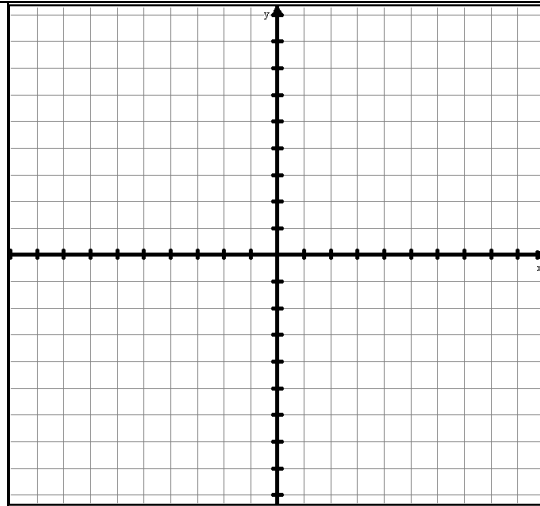
Equation	Description	Graph
$y = h(x)$		
$q(x) = 3h(2x)$		
$q(x) = -2h(x-5)$		
$q(x) = h(0.5 \cdot (x+1)) + 2$		
$q(x) = 4h(x) - 3$		
$q(x) = \frac{1}{2}h(x+8) + 1$		

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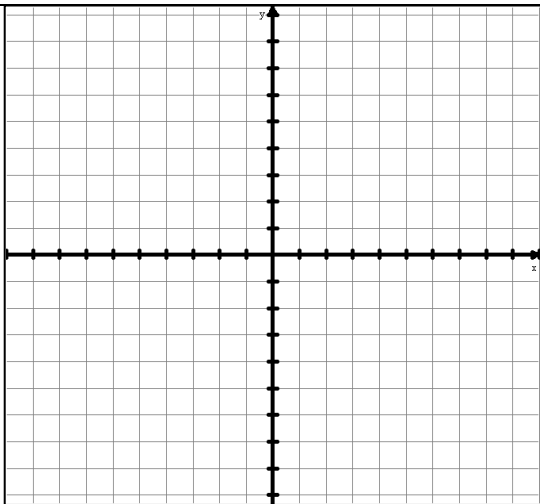
(E) Applying Multiple Function Transformations → Working from Equations



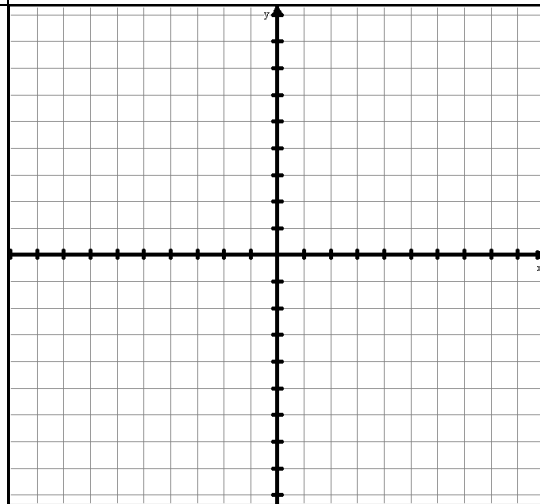
$$f(x) = x^2 - 3$$



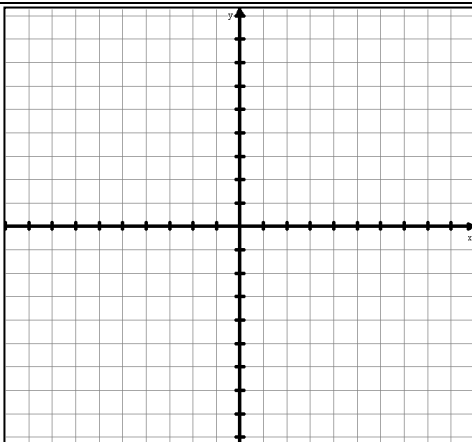
$$f(x) = (x+1)^2 - 3$$



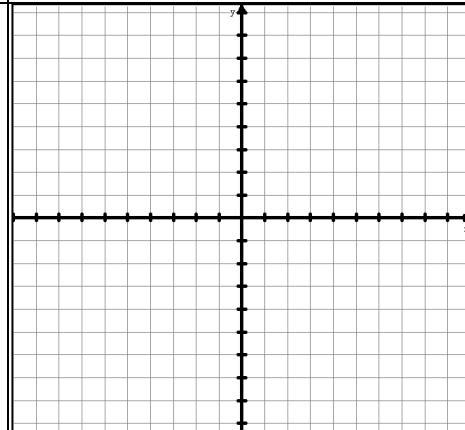
$$f(x) = \sqrt{x-4}$$



$$f(x) = \sqrt{x-4} + 3$$



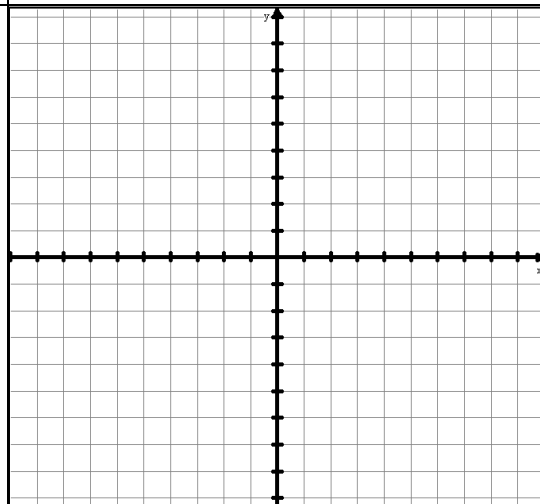
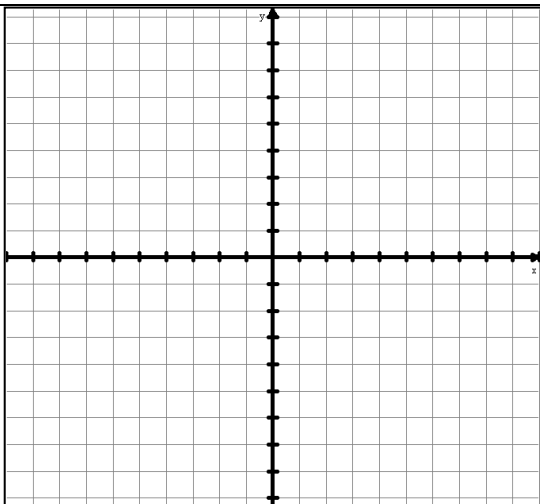
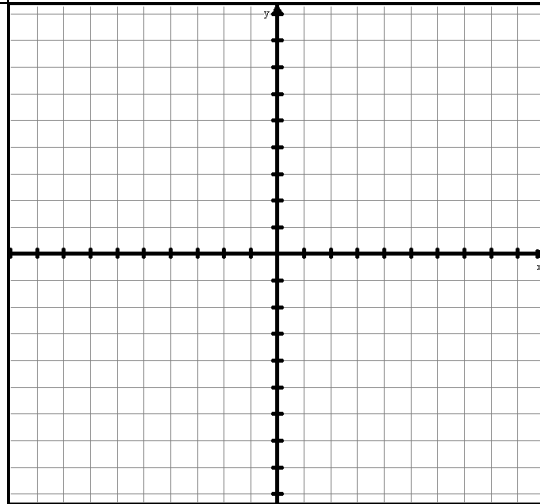
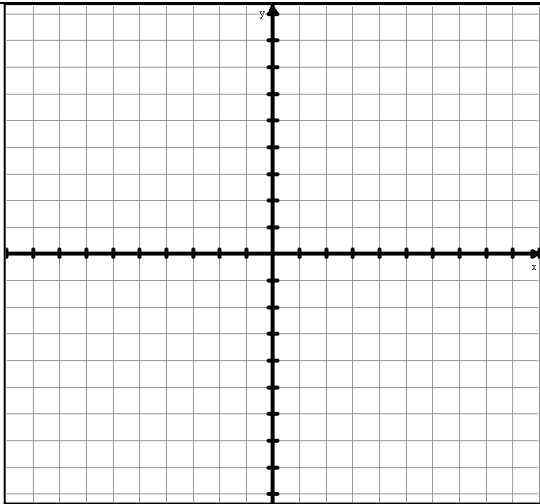
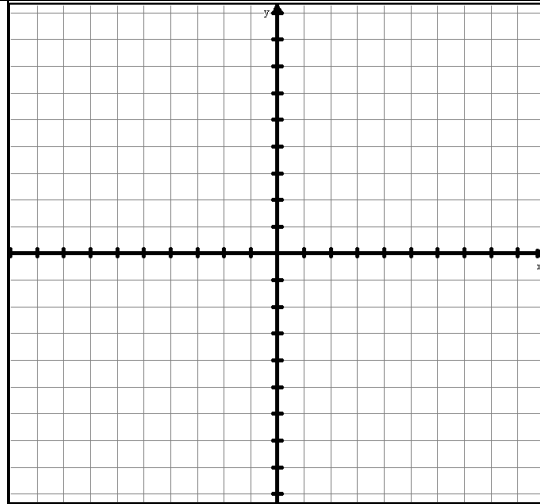
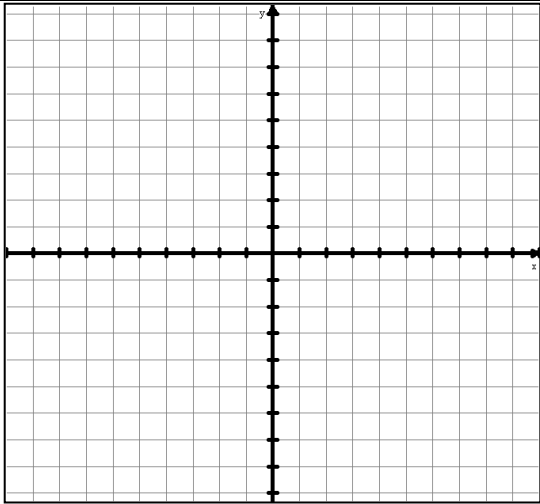
$$f(x) = \frac{1}{x} + 2$$



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

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(D) Applying Multiple Function Transformations → Working from Equations



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(E) Determining Equations → Working With Transformed Functions

