

# STATION A

Simplify and **state the restrictions**.

1. 
$$\frac{2x^2 - x - 3}{x^2 + 3x + 2} \div \frac{2x^2 + x - 6}{x^2 - 3x - 4}$$

2. 
$$\frac{x - 3}{x^2 - 7x + 10} - \frac{x + 2}{x^2 - 25}$$

3. 
$$\frac{x}{x + 3} + \frac{2x + 2}{x^2 + x - 6} \times \frac{x^2 + 13x - 30}{8x + 8}$$

# STATION B

1. For each of the given functions, state the domain and range:

Function	Domain	Range
a) $f(x) = \frac{2}{x-2} + 3$		
b) $f(x) = -\sqrt{2x-1}$		
c) $f(x) = \frac{1}{2}x^3 - 5$		

2. Given  $f(x) = 5|x - 6| + 3$ , state where the function is increasing.

# STATION C

1. Describe the points which are invariant under each type of transformation:

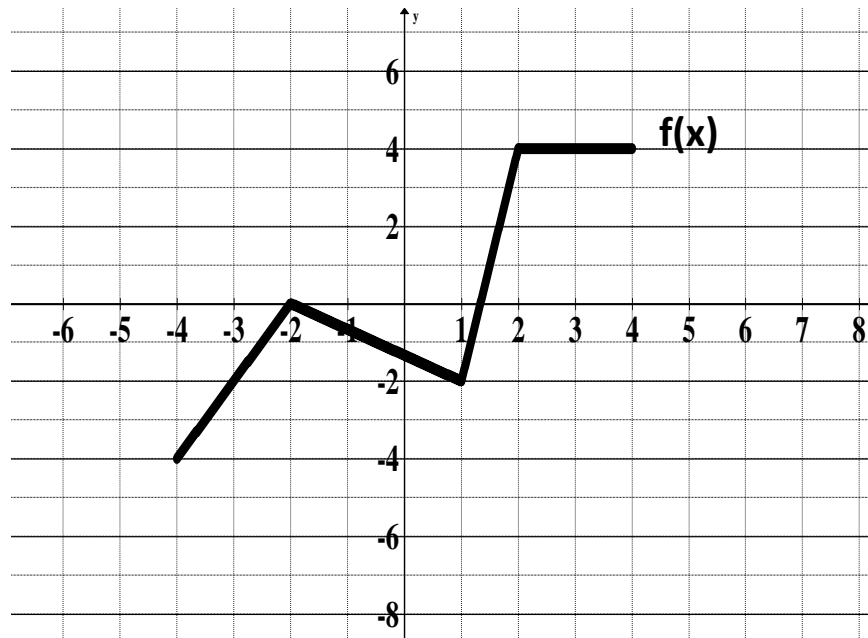
- a) reflection in the x-axis
- b) vertical stretch
- c) the inverse relation

2. Complete the table.

Original Function	Equation of Transformed Function	Transformations (in order)
a) $f(x) = \sqrt{x}$	$g(x) = -\sqrt{2(x-3)} + 4$	
b) $f(x) = x^2$		<ul style="list-style-type: none"><li>• Reflection in the y-axis</li><li>• Vertical stretch by a factor of 7</li><li>• Horizontal translation left 3</li><li>• Vertical translation down 5</li></ul>
c) $y = f(x)$		<ul style="list-style-type: none"><li>• Reflection in the x-axis</li><li>• Horizontal stretch by a factor of 4</li><li>• Vertical stretch by a factor of 2</li><li>• Horizontal translation right 6</li></ul>

# STATION D

The graph of  $y = f(x)$  is shown below. State the transformations for each of the following, then graph.



1.  $g(x) = \frac{1}{2}f(-x + 3) - 4$

2.  $h(x) = -f(2x + 6) + 2$

# STATION E

State the base function, the transformations that have occurred, in order, and then graph each function (clearly show key points).

1.  $f(x) = -\frac{1}{2} \left| \frac{1}{3}(x + 3) \right|$

2.  $f(x) = \sqrt{6 - 2x} - 4$

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

# STATION F

1. a) Graph the inverse of  $f(x) = 2(x + 5)^2 - 3$ .

b) Restrict the domain of  $f(x)$  so that  $f^{-1}(x)$  is also a function.

2. Algebraically determine the equation of the inverse of each of the following functions. State restrictions if necessary.

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

b)  $f(x) = \sqrt{x - 4} + 5$

# STATION G

Under what conditions is...

$$\frac{-4x^3 - 7x^2 - 3x}{12x + 13x^2 - 4x^3} = \frac{2x^3 + x^2 - x}{2x^3 - 9x^2 + 4x} \quad \text{true?}$$