

**Kerry Ojakian's MTH 30 Class**  
**Class Assignment #5**

1. How does  $f(x + 21) - 8$  transform the graph of  $f(x)$ ?

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2. How does  $g(x - 1) - 42$  transform the graph of  $g(x)$ ?

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3. Write a formula for the function obtained when the graph of  $f(x) = x^3$  is shifted up 1 unit and to the left 2 units.

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4. Write a formula for the function obtained when the graph of  $f(x) = |x|$  is shifted up 3 units and to the right 7 units.

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5. Write a formula for the function obtained when the graph of  $g(x) = \frac{1}{x}$  is shifted down 4 units and to the right 5 units.

Write the resulting function as a single rational expression!

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6. Graph  $f(x) = x^2$ . Then:

(a) Let  $g(x) = (x + 3)^2 - 1$ . Describe in words the transformation from graph  $f$  to graph  $g$ .

(b) Let  $h(x) = -x^2$ . Describe in words the transformation from graph  $f$  to graph  $h$ .

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7. Determine where the function  $f(x) = (x - 4)^2$  is increasing and where it is decreasing. Use graph transformations.
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8. Determine where the function  $g(x) = -3 + (x + 42)^3$  is increasing and where it is decreasing. Use graph transformations (this problem is easy!).
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9. Determine where the function  $g(x) = \frac{1}{x - 20} - 30$  is increasing and where it is decreasing. Use graph transformations.
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10. Consider  $f(x) = x^2 + 5$ . On one axis graph the basic function it is transformed from. Then on another axis, graph  $f(x)$  using graph transformations.
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11. Consider  $g(x) = |x + 3| - 5$ . On one axis graph the basic function it is transformed from. Then on another axis, graph  $g(x)$  using graph transformations.

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12. Consider  $h(x) = 2^{x-2} - 2$ . On one axis graph the basic function it is transformed from. Then on another axis, graph  $h(x)$  using graph transformations.

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13. Consider  $f(x) = 4^{-x}$ . On one axis graph the basic function it is transformed from. Then on another axis, graph  $f(x)$  using graph transformations.
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