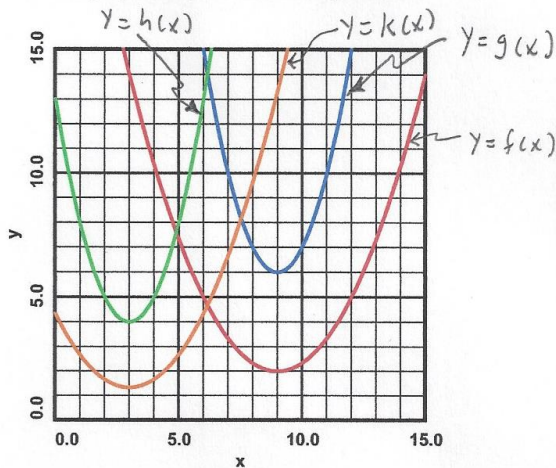


PRE-AP ALGEBRA 2

1) For $y = f(x) = \frac{1}{3}x^2 - 6x + 29$:

- Graph $y = f(x)$ on the axes provided.
- Construct a function $y = g(x)$ by vertically stretching $y = f(x)$ by a factor of 3.
- Graph $y = g(x)$ on the axes provided.
- Construct a function $y = h(x)$ by translating $y = g(x)$ by $(x_0, y_0) = (-6, -2)$.
- Graph $y = h(x)$ on the axes provided.



$$\begin{aligned} b) \quad y = g(x) &= 3f(x) = \\ &= 3\left(\frac{1}{3}x^2 - 6x + 29\right) = \\ &= x^2 - 18x + 87 \end{aligned}$$

$$\begin{aligned} d) \quad y = h(x) &= g(x+6) - 2 = \\ &= (x+6)^2 - 18(x+6) + 87 - 2 = \\ &= (x^2 + 12x + 36) + (-18x - 108) + 87 - 2 = \\ &= x^2 - 6x + 13 \end{aligned}$$

2A.5 CLASSWORK

- 2) The transformation in problem 1 of taking $y = f(x)$ to $y = h(x)$ is equivalent to:

- Construct a function $y = k(x)$ by translating $y = f(x)$ by $(x_0, y_0) = (-6, -\frac{2}{3})$.
- Graph $y = k(x)$ on the axes of problem 1.
- Construct $y = h(x)$ from problem 1 by vertically stretching $y = k(x)$ by a factor of 3.

$$\begin{aligned} a) \quad y = k(x) &= f(x+6) - \frac{2}{3} = \\ &= \frac{1}{3}(x+6)^2 - 6(x+6) + 29 - \frac{2}{3} = \\ &= \frac{1}{3}(x^2 + 12x + 36) - 6(x+6) + 29 - \frac{2}{3} = \\ &= \left(\frac{1}{3}x^2 + 4x + 12\right) + (-6x - 36) + 29 - \frac{2}{3} = \\ &= \frac{1}{3}x^2 - 2x + \frac{13}{3} \end{aligned}$$

$$\begin{aligned} c) \quad y = h(x) &= 3k(x) = \\ &= 3\left(\frac{1}{3}x^2 - 2x + \frac{13}{3}\right) = \\ &= x^2 - 6x + 13 \end{aligned}$$