

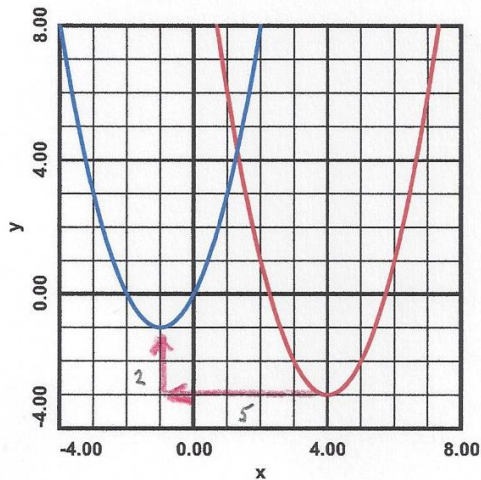
PRE-AP ALGEBRA 2

For problems 1 and 2, given $y = f(x)$ and (x_0, y_0) :

- Calculate $g(x) = f(x - x_0) + y_0$, which is the translation of $y = f(x)$ by (x_0, y_0) .
- To verify the translation, graph both $y = f(x)$ and $y = g(x)$ on the axes provided.

1) $y = f(x) = x^2 - 8x + 13$

$(x_0, y_0) = (-5, 2)$



$$\begin{aligned} g(x) &= f(x+5) + 2 = \\ &= (x+5)^2 - 8(x+5) + 13 + 2 = \\ &= (x^2 + 10x + 25) + (-8x - 40) + 13 + 2 = \\ &= x^2 + 2x \end{aligned}$$

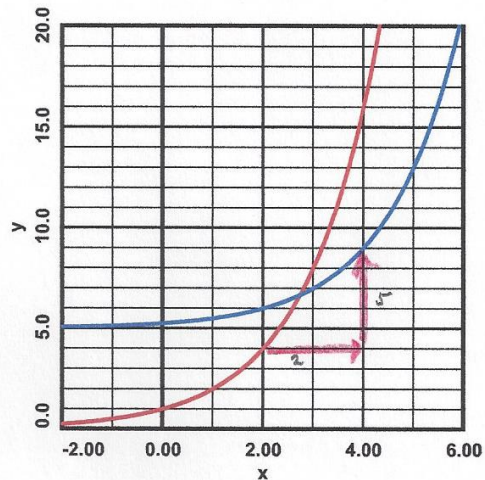
~~Red line~~ $y = f(x) = x^2 - 8x + 13$

~~Blue line~~ $y = g(x) = x^2 + 2x$

2A.4 CLASSWORK

2) $y = f(x) = 2^x$

$(x_0, y_0) = (2, 5)$



$$\begin{aligned} g(x) &= f(x-2) + 5 = 2^{x-2} + 5 = \\ &= 2^x \cdot 2^{-2} + 5 = \frac{1}{4} \cdot 2^x + 5 \end{aligned}$$

~~Red line~~ $y = f(x) = 2^x$

~~Blue line~~ $y = g(x) = \frac{1}{4} \cdot 2^x + 5$