

Quiz 7, 26 October 2008

1. Complete the square to write  $2x^2 - 8x + 11$  in the form  $A(x - B)^2 + C$ .

*Solution:*

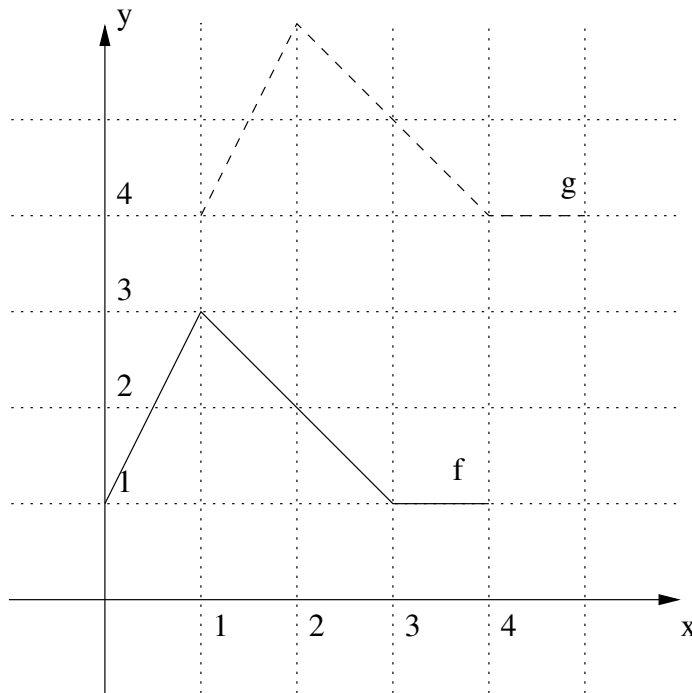
$$\begin{aligned} 2x^2 - 8x + 11 &= 2(x^2 - 4x) + 11 \\ &= 2(x^2 - 4x + 4 - 4) + 11 \\ &= 2(x^2 - 4x + 4) - 8 + 11 \\ &= 2(x - 2)^2 + 3 \end{aligned}$$

You may check your answer by re-expanding the square and collecting like terms.

2. The solid line in the graph below is the graph of  $f(x)$ . Find a function of the form  $g(x) = f(x - A) + B$  whose graph is the dotted line.

*Solution:* To obtain the graph of  $g$ , we shift the graph of  $f$  one unit to the right and up two units. Thus,  $g(x) = f(x - 1) + 3$ .

You may check your answer by picking points a value of  $x$ , say  $x = 2$ . Read the value of  $f(2 - 1) = f(1)$  off the graph of  $f$  and determine if the point  $(2, f(1) + 3) = (2, 6)$  lies on the graph of  $g$ .



3. Suppose the point  $(2, 1)$  lies on the graph of  $g(x) = f(2x) - 1$ . Find one point on the graph of  $f(x)$ .

*Solution:* We know that  $1 = g(2) = f(4) - 1$ . Thus  $f(4) = 2$  so the point  $(4, 2)$  lies on the graph of  $f$ .