**1.**

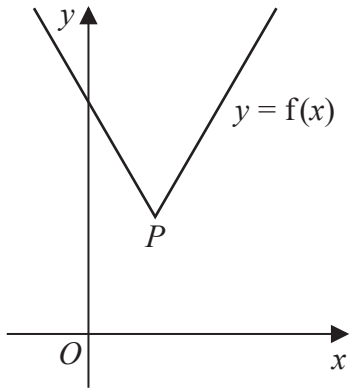



**Figure 1**

Figure 1 shows a sketch of the graph with equation $y = f(x)$ where

$$f(x) = 2|x - 5| + 10$$

The point $P$, shown in Figure 1, is the vertex of the graph.

(a) State the coordinates of $P$

**(2)**

(b) Use algebra to solve

$$2|x - 5| + 10 > 6x$$

(*Solutions relying on calculator technology are not acceptable.*)

**(2)**

(c) Find the point to which $P$ is mapped, when the graph with equation $y = f(x)$ is transformed to the graph with equation $y = 3f(x - 2)$

**(2)**

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**Question 1 continued**

**(Total for Question 1 is 6 marks)**

**2.** $$g(x) = \frac{2x^2 - 5x + 8}{x - 2}$$

(a) Write $g(x)$ in the form

$$Ax + B + \frac{C}{x - 2}$$

where $A$, $B$ and $C$ are integers to be found.

**(3)**

(b) Hence use algebraic integration to show that

$$\int_4^8 g(x)\,dx = \alpha + \beta \ln 3$$

where $\alpha$ and $\beta$ are integers to be found.

**(4)**

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