

The diagram shows part of the curve $y = -x^2 + 8x - 10$ which passes through the points *A* and *B*. The curve has a maximum point at *A* and the gradient of the line *BA* is 2.

(i) Find the coordinates of
$$A$$
 and B . [7]

(ii) Find
$$\int y \, dx$$
 and hence evaluate the area of the shaded region. [4]