

Higher Ink Exercise Block 1 – Mixed

Calculators should only be used when necessary

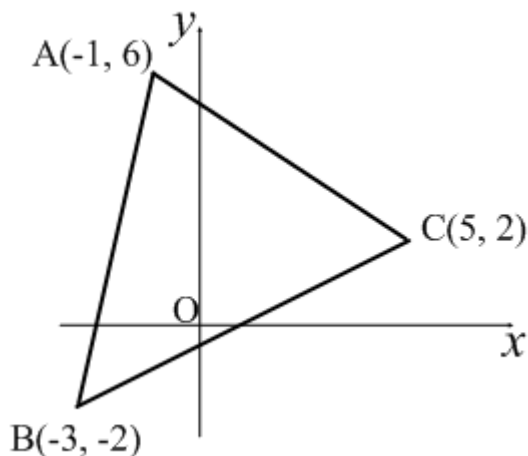
1. Triangle ABC has vertices $A(-1, 6)$, $B(-3, -2)$ and $C(5, 2)$.

Find:

- a) the equation of the line p ,
the median from C.

- b) the equation of the line q , the
perpendicular bisector of BC.

- c) the coordinates of the point of
intersection of lines p and q .



(3)

(4)

(2)

2. a) Express $f(x) = 2x^2 + 4x - 3$ in the form $a(x + b)^2 + c$.

(2)

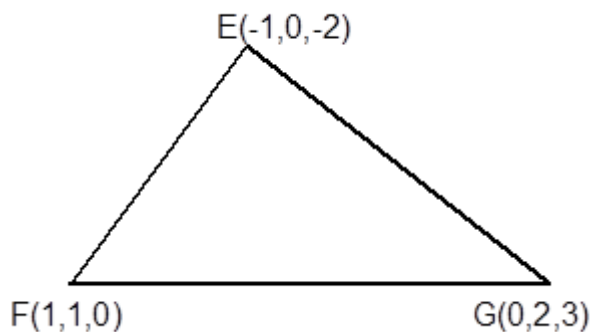
- b) Hence or otherwise sketch the graph of $y = f(x)$.

(3)

3. Find the coordinates of the point on the curve $y = 2x^2 - 7x + 10$ where the tangent to the curve makes an angle of 45° with the positive direction of the x-axis.

(5)

4. Calculate the size of angle FEG
in the diagram shown.



(7)

5. $f(x) = x^3 - x^2 - 5x - 3$.

(a) (i) Show that $(x+1)$ is a factor of $f(x)$.

(ii) Hence or otherwise factorise $f(x)$ fully. (5)

(b) One of the turning points of the graph of $y = f(x)$ lies on the x -axis.

Write down the coordinates of this turning point. (1)

6. A function f is defined by the formula $f(x) = (x - 1)^2(x + 2)$ where $x \in \mathfrak{R}$.

(a) Find the coordinates of the points where the curve with equation

$y = f(x)$ crosses the x and y axes. (2)

(b) Find the stationary points of the curve $y = f(x)$ and determine their nature. (8)

(c) Sketch the curve $y = f(x)$. (2)

TOTAL = 44 MARKS