12 **(a)** Find the gradient of the curve $y = 2x^3 - 7x + 4$ when $x = -2$.

..... [3]

(b) A is the point (7, 2) and B is the point (−5, 8).

(i) Calculate the length of AB.

..... [3]

(ii) Find the equation of the line that is perpendicular to AB and that passes through the point (−1, 3).
Give your answer in the form $y = mx + c$.

$y =$ ..... [4]

(iii) AB is one side of the parallelogram $ABCD$ and

- $\overrightarrow{BC} = \begin{pmatrix} -a \\ -b \end{pmatrix}$ where $a > 0$ and $b > 0$
- the gradient of BC is 1
- $\left|\overrightarrow{BC}\right| = \sqrt{8}$.

Find the coordinates of D.

(..... , ...) [4]