

13. (a) Factorise completely $x^3 + 10x^2 + 25x$

(2)

(b) Sketch the curve with equation

$$y = x^3 + 10x^2 + 25x$$

showing the coordinates of the points at which the curve cuts or touches the x -axis.

(2)

The point with coordinates $(-3, 0)$ lies on the curve with equation

$$y = (x + a)^3 + 10(x + a)^2 + 25(x + a)$$

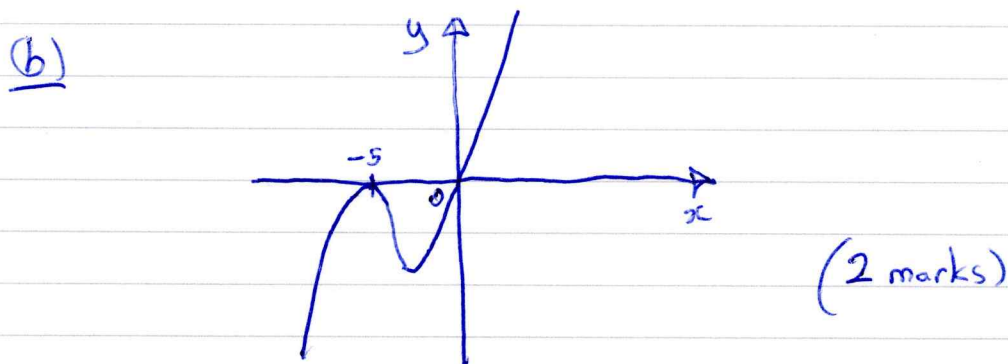
where a is a constant.

(c) Find the two possible values of a .

(3)

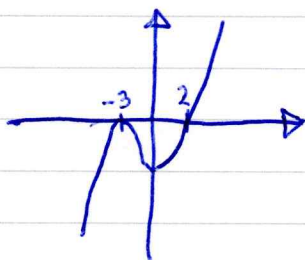
(a)

$$\begin{aligned} x^3 + 10x^2 + 25x & \\ = x(x^2 + 10x + 25) & \quad (1 \text{ mark}) \\ = x(x+5)^2 & \quad (1 \text{ mark}) \end{aligned}$$



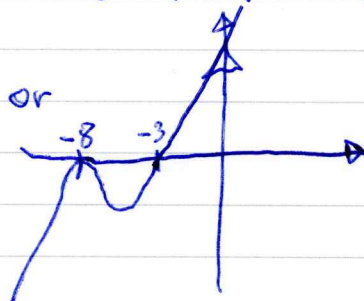
(c) $f(x+a)$ is translation of $f(x)$
a units to the left. (1 mark)

now,
either



$$\Rightarrow a = -2$$

(1 mark)



$$a = 3$$

(1 mark)