



15th March

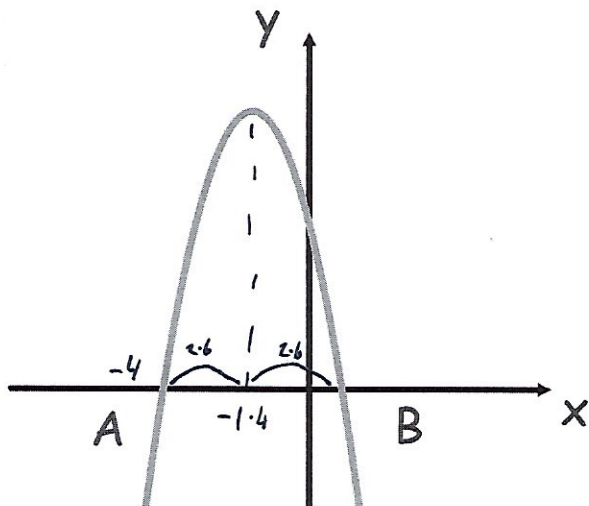
Expand and simplify fully

$$(x + 7)(x + 3)(x + 4)$$

$$(x^2 + 10x + 21)(x + 4)$$

$$x^3 + 4x^2 + 10x^2 + 40x + 21x + 84$$

$$x^3 + 14x^2 + 61x + 84$$



Write down the coordinates of point B

$$(2, 0)$$

Shown is a graph  $y = f(x)$  where  $f(x)$  is a quadratic function.  
The coordinates of point A are  $(-4, 0)$   
The maximum point is  $(-1.4, 2.6)$

The equation  $f(x) = k$  has exactly one solution.

Write down the value of  $k$

$$k = 2.6$$

$$y = ax^3 - 4x^2$$

Given  $\frac{d^2y}{dx^2} = -20$  when  $x = -\frac{1}{3}$

Find  $a$

$$a = 6$$

$$\frac{dy}{dx} = 3ax^2 - 8x$$

$$\frac{d^2y}{dx^2} = 6ax - 8$$

$$-20 = 6\left(-\frac{1}{3}\right)a - 8$$

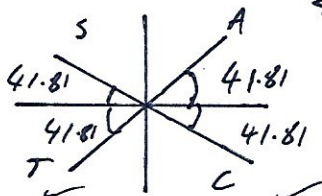
$$-12 = -2a$$

Solve  $9\sin\theta = -6$

where  $0^\circ < \theta < 360^\circ$

$$\sin\theta = -\frac{2}{3}$$

$$\sin^{-1}\left(\frac{2}{3}\right) = 41.81$$



$$\theta = 221.81^\circ, 318.19^\circ$$