9th January **Higher Plus 5-a-day**

Corbettmaths

Simplify

$$\frac{18x^{\frac{5}{4}}}{6x}$$

$3x^{\frac{1}{4}}$

Find the equation of the straight line passing through B(–2, 8) and C(1, 0).

Give your answer in the form
ax + by + c = 0
where a, b and c are integers.

gradient $= -\frac{8}{3}$

$y = -\frac{8}{3}x + \frac{8}{3}$

$\frac{8}{3}x + y - \frac{8}{3} = 0$

$8x + 3y - 8 = 0$

$y = -\frac{8}{3}x + c$

$0 = -\frac{8}{3} + c$

$c = \frac{8}{3}$

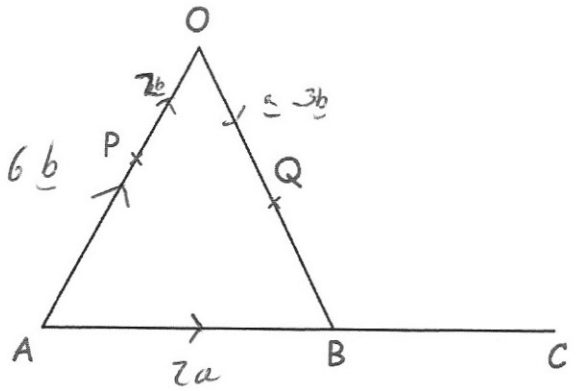
Express $3x^2 + 12x + 13$ in the form $a(x + b)^2 + c$

$3\left(x^2 + 4x + \frac{13}{3}\right)$

$3\left[(x+2)^2 - 4 + \frac{13}{3}\right]$

$3\left[(x+2)^2 + \frac{1}{3}\right]$

$3(x+2)^2 + 1$



AOB is a triangle.
P is a point on AO.

$\vec{AB} = 2\mathbf{a}$ $\vec{AO} = 6\mathbf{b}$

$AP : PO = 2 : 1$

Find the vector $\vec{OB}$ in terms of **a** and **b**

$2\underline{a} - 6\underline{b}$

$\vec{PQ} = \vec{PO} + \vec{OQ}$

$= 2\underline{b} + (\underline{a} - 3\underline{b})$

$= \underline{a} - \underline{b}$

$\vec{QC} = \vec{QB} + \vec{BC}$

$= \underline{a} - 3\underline{b} + 2\underline{a}$

$= 3\underline{a} - 3\underline{b}$

Q is the midpoint of OB.
B is the midpoint of AC.
Show PQC is a straight line.

$\vec{QC} = 3\vec{PQ}$

$\therefore$ $\vec{QC}$ & $\vec{PQ}$ are parallel and since they both pass through Q, PQC is a straight line.