**5th October** **Higher Plus 5-a-day**

Corbettmaths

A circle has a radius of 3 and centre (0, 0)

Write down the equation of the circle.

$x^2 + y^2 = 9$

Navid makes 5-digit numbers using all of the number cards below.

| 1 | 2 | 3 | 5 | 8 |
|---|---|---|---|---|

How many different numbers less than 70000 can he make?

5 _ _ _ _
1 x 4 x 3 x 2 x 1 = 24

3 _ _ _ _
1 x 4 x 3 x 2 x 1 = 24

2 _ _ _ _
1 x 4 x 3 x 2 x 1 = 24

1 _ _ _ _
1 x 4 x 3 x 2 x 1 = 24

96

The line with equation $y = 3x + 5$ passes through the points A(–4, –7) and B(0, 5)

(-2, -1)

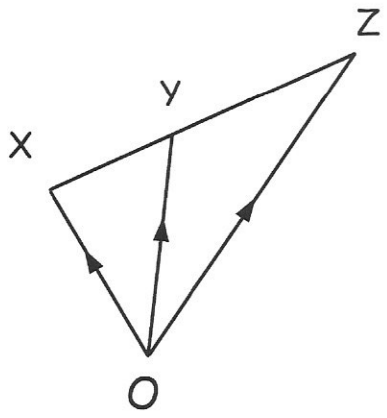
Find the equation of the line that passes through the midpoint of AB and it perpendicular to $y = 3x + 5$.

$y = -\frac{1}{3}x + c$

$-1 = \frac{2}{3} + c$

$c = -1\frac{2}{3}$

$y = -\frac{1}{3}x - \frac{5}{3}$




$\overrightarrow{OX} = 5\mathbf{a} + \mathbf{b}$ $\overrightarrow{OY} = 7\mathbf{a} - \mathbf{b}$

XYZ is a straight line such that
XY : YZ = 3:4

Find the vector

$\overrightarrow{XY} = \overrightarrow{XO} + \overrightarrow{OY}$

in terms of **a** and **b**

$-5\underline{a} - \underline{b} + 7\underline{a} - \underline{b}$

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

Find the vector

$\overrightarrow{OZ} = \overrightarrow{OY} + \overrightarrow{YZ}$

in terms of **a** and **b**

$7\underline{a} - \underline{b} + \frac{4}{3}(2\underline{a} - 2\underline{b})$

$7\underline{a} - \underline{b} + \frac{8}{3}\underline{a} - \frac{8}{3}\underline{b}$

$9\frac{2}{3}\underline{a} - 3\frac{2}{3}\underline{b}$