

24th March

Corbettmaths

Solve $2x^2 - x - 6 = 0$

$$(x-2)(2x+3) = 0$$

$$x=2 \quad \text{or} \quad x = -\frac{3}{2}$$

A headteacher wants to survey two Year 7 students. There are 100 students in Year 7.

How many possible pairs of students can the headteacher pick?

$$\frac{100 \times 99}{2} = 4950$$

The transformation matrix

$$\begin{pmatrix} p & q \\ 2p & 5q \end{pmatrix} \begin{pmatrix} -1 \\ -2 \end{pmatrix} = \begin{pmatrix} -1 \\ 16 \end{pmatrix}$$

maps the point $(-1, -2)$ to the point $(-1, 16)$.

Find p and q

$$\begin{aligned} -p - 2q &= -1 & p + 2q &= 1 \\ -2p - 10q &= 16 & p + 5q &= -8 \\ \hline & & 3q &= -9 \\ & & q &= -3 \\ p &= 7 & q &= -3 \end{aligned}$$

The coefficient of the x^3 term in the expansion of $(x+a)^4$ is 32

Work out the value of a

$$\begin{array}{cccc} & & 1 & & \\ & & 1 & & \\ & & 4 & & \\ & 1 & 4 & & \\ & 6 & 4 & & \\ 1 & 4 & 6 & 4 & 1 \end{array}$$

$$4(x^3)a = 32x^3$$

$$4a = 32$$

$$a = 8$$

Point A lies on the curve $y = (x+2)(x-7)$

The x-coordinate of A is 9

Find the equation of the normal to the curve at A.

$$y = x^2 - 5x - 14$$

$$\frac{dy}{dx} = 2x - 5$$

$$\text{when } x=9 \quad \frac{dy}{dx} = 18 - 5 = 13 \quad y = 22$$

$$y = -\frac{1}{13}x + c$$

$$22 = -\frac{9}{13} + c$$

$$c = 22\frac{9}{13}$$

$$y = -\frac{1}{13}x + 22\frac{9}{13}$$