Name: _____ 5-a-day Further Maths

21st April

Corbettmaths

Point A has coordinates (5, 7)
Point B has coordinates (13, –27)

Find the equation of the line perpendicular to AB that passes through the midpoint of AB

$m = \frac{-34}{8} = -\frac{17}{4}$

$y = \frac{4}{17}x + c$

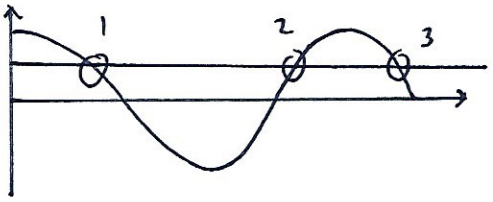
m(9, -10)

$-10 = \frac{4}{17} \times 9 + c$ $\quad c = -\frac{206}{17}$

$y = \frac{4}{17}x - \frac{206}{17}$

How many solutions of $cosx = k$, where $0 < k < 1$, are between $0°$ and $450°$?

3



$y = \frac{8x^5 + x^7}{2x^3}$

Work out the value of $\frac{d^2y}{dx^2}$ when x = –1

(14)

$y = 4x^2 + \frac{1}{2}x^4$

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

$\frac{d^2y}{dx^2} = 8 + 6x^2$ $\quad x = -1$

$\frac{d^2y}{dx^2} = 14$

Find the transformation matrix that is equivalent to

- a reflection in the line y = x $\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$

followed by

- a rotation, 90° anticlockwise about the origin $\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$

$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix} = \begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$

© Corbettmaths 2019