Name: _____ 5-a-day Further Maths

17th June

Corbettmaths

How many points of intersection does the circle $x^2 + y^2 = 9$ have with the line $x + y = 6$?

$x+y=6 \Rightarrow y=6-x$

$x^2+(6-x)^2=9$

$x^2+36-12x+x^2=9$

$2x^2-12x+27=0$

$b^2-4ac=12^2-4\times2\times27=-72<0$

$\Rightarrow$ None.

The transformation matrix $\begin{pmatrix} b & -2 \\ -1 & 3 \end{pmatrix}$ maps the point $(5, 1)$ onto the point $(16, c)$

Find b and c

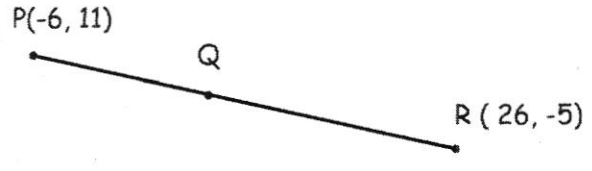
$\begin{pmatrix} b & -2 \\ -1 & 3 \end{pmatrix}\begin{pmatrix} 5 \\ 1 \end{pmatrix}=\begin{pmatrix} 16 \\ c \end{pmatrix}$

$5b-2=16 \Rightarrow b=\frac{18}{5}$

$-2=c$

Solve $cos\theta = -0.11$ for $0° \leq \theta \leq 360°$

$\theta = 96.3°, 263.7°$



PQ : PR = 2 : 5

Find the coordinates of the point Q.

$\overrightarrow{PR}=\begin{pmatrix} 32 \\ -16 \end{pmatrix}$

$\overrightarrow{OQ}=\overrightarrow{OP}+\frac{2}{5}\overrightarrow{PR}=\begin{pmatrix} -6 \\ 11 \end{pmatrix}+\frac{2}{5}\begin{pmatrix} 32 \\ -16 \end{pmatrix}$

$=\begin{pmatrix} \frac{34}{5} \\ \frac{23}{5} \end{pmatrix}$ Q(6.8, 4.6)