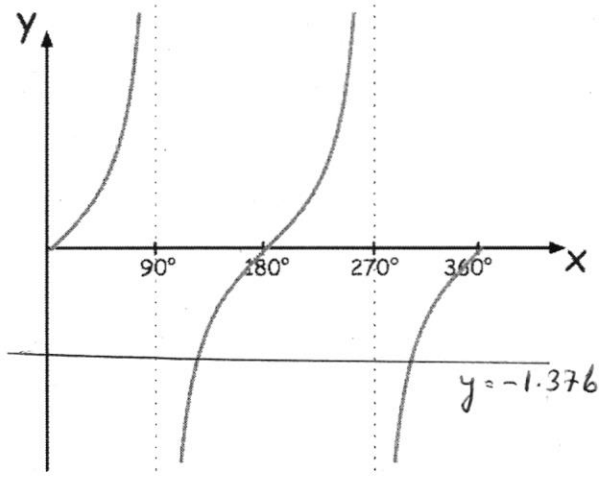
Name: _____ 5-a-day Further Maths

19th August

Corbettmaths

Here is a sketch of $y = tanx$ for $0° \leq x \leq 360°$

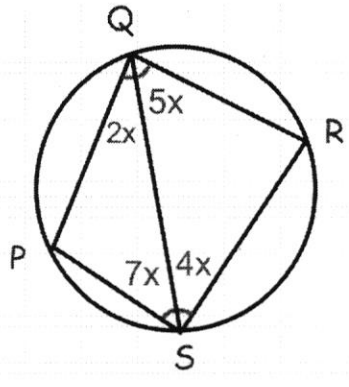


Given that $tan54° = 1.376$

Solve $tanx = -1.376$ for $0° \leq x \leq 360°$

$x = 180 - 54, \ 360 - 54$

$x = 126°, \ 306°$



Prove QS is a diameter.

Cyclic quad $\Rightarrow P\hat{Q}R + P\hat{S}R = 180°$

$\Rightarrow 7x + 11x = 180°$

$\Rightarrow 18x = 180°$

$\Rightarrow x = 10$

$\Rightarrow Q\hat{P}S = Q\hat{R}S = 90°$

$\Rightarrow$ QS diameter.

The transformation matrix $\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$ maps point P to point Q.

The transformation matrix $\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$ maps point Q to point R.

Point P is $(7, -2)$.

Work out the coordinates of point R.

$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}\begin{pmatrix} 7 \\ -2 \end{pmatrix}$

$= \begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}\begin{pmatrix} -7 \\ -2 \end{pmatrix}$

$= \begin{pmatrix} 2 \\ 7 \end{pmatrix}$

$R(2, 7)$