Name: _____ 5-a-day Further Maths

13th February

Corbettmaths

Solve $\frac{2x-1}{4} = \frac{1}{2x-1}$

$(2x-1)^2 = 4$

$2x-1 = \pm 2$

$2x = 3$ or -1

$x = \frac{3}{2}$ or $-\frac{1}{2}$

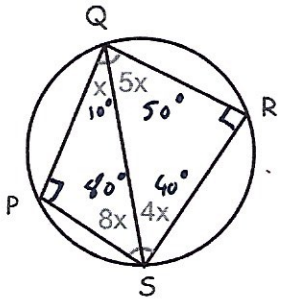
Rationalise the denominator of

$\frac{33}{4-\sqrt{5}} \times (4+\sqrt{5}) \times (4+\sqrt{5})$

Give your answer in the form $a + b\sqrt{5}$

$\frac{132+33\sqrt{5}}{16-5} = \frac{132+33\sqrt{5}}{11}$

$= 12 + 3\sqrt{5}$



Prove QS is a diameter.

$12x + 6x = 180$ $x = 10°$

Since $\angle QRS = 90°$, then QS is the diameter.

Work out the matrix that transforms the unit square by a 90° clockwise rotation about *O*.

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

$\begin{pmatrix} x & y \\ z & a \end{pmatrix}\begin{pmatrix} 0 \\ 1 \end{pmatrix} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$ $y = 1$, $a = 0$

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

$y = \frac{8x^5 + x^7}{2x}$ $y = 4x^4 + \frac{1}{2}x^6$

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

$\frac{dy}{dx} = 16x^3 + 3x^5$

$\frac{d^2y}{dx^2} = 48x^2 + 15x^4$

$48 \times 2^2 + 15 \times 2^4 = 432$