5 The equation of a curve is $y = 2\cos x$.

(i) Sketch the graph of $y = 2\cos x$ for $-\pi \leqslant x \leqslant \pi$, stating the coordinates of the point of intersection with the y-axis. [2]

Points P and Q lie on the curve and have x-coordinates of $\frac{1}{3}\pi$ and π respectively.

(ii) Find the length of PQ correct to 1 decimal place. [2]

....

....

....

....

....

....

....

....

....

The line through P and Q meets the x-axis at H $(h, 0)$ and the y-axis at K $(0, k)$.

(iii) Show that $h = \frac{5}{9}\pi$ and find the value of k. [3]

....

....

....

....

....

....

....

....

....

....

....

....

....

....

....

....

....

....

....

....

....

....