WWW.M4THS.COM

A LEVEL MATHS

(24) Using Radians as a Measurement of Angles

WORKING AT D/E

(1) Without a calculator, convert each of the following to radians, giving your answers as multiples of π:

(a) 30^0 (b) 60^0 (c) 45^0 (d) 90^0

(e) 120^0 (f) 0^0 (g) 360^0 (h) 180^0

(2) Without a calculator, convert each of the following to degrees:

(a) $\frac{\pi}{3}$ (b) $\frac{\pi}{4}$ (c) π (d) $\frac{\pi}{2}$ (e) 4π

(3) (a) Use a calculator to convert each of the following to degrees. Give answers to 1dp.

(i) 1.2^c (ii) 0.87^c (iii) 5.36^c

(b) Use a calculator to convert each of the following to radians giving answers to 3SF.

(i) 37^o (ii) 254^o (iii) 112^o

WORKING AT B/C

(1) Without a calculator, convert each of the following to radians, giving your answers as multiples of π:

(a) 240^0 (b) 300^0 (c) 135^0 (d) 15^0

(e) -30^0 (f) -45^0 (g) 210^0 (h) -90^0

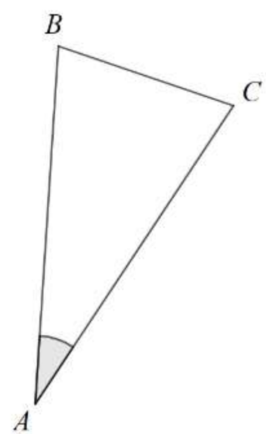
(2) Without a calculator, convert each of the following to degrees:

(a) $\frac{-2\pi}{3}$ (b) $-\frac{5\pi}{4}$ (c) 3π

(d) $-\frac{\pi}{6}$ (e) -2π (f) 8π

(3) ΔABC is shown below. $AB = \sqrt{3}$, $AC = 2$ and $< BAC = \frac{\pi}{6}$

Without using a calculator, **show that** the area of ΔABC is $\frac{\sqrt{3}}{2}$ units.



WORKING AT A*/A

(1) (a) Sketch the graph of $y = \sin\left(x - \frac{\pi}{2}\right)$, $0 \leq x \leq 2\pi$ show where the curve meets or crosses the coordinate axes. Write down the coordinates of any maximum or minimum points.

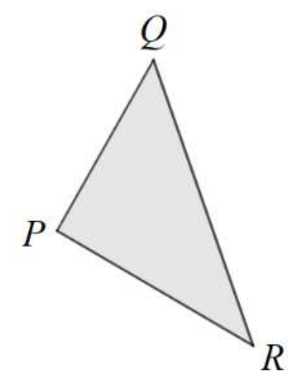
(b) The graph of $y = p\cos(\theta - q)$, $0 \leq \theta \leq 2\pi$ where p is a positive constant and $0 < q < \frac{\pi}{2}$ crosses the θ axis at $\left(\frac{5\pi}{6}, 0\right)$ and $\left(\frac{11}{6}, 0\right)$.

The graph has a maximum point at $(r, 8)$.

Find the values of p, q and r giving q and r in terms of π

(2) ΔPQR is shown below. $PR = \sqrt{3}$, $QR = 2$ and $< PRQ = \frac{\pi}{6}$

Without using a calculator, find the length of PR in its simplest form.



(3) Show, without using a calculator, that $\left(\cos\left(\frac{\pi}{6}\right) + \sin\left(\frac{\pi}{3}\right)\right)^4$ is an integer.