AQA
Realising potential

TOPIC TEST
MAR K SCHEME

AS and A-level MATHS

Trigonometry 2

Mark sch eme

Specification content coverage: E5, E7

Question	Solutions	Mark
1	$1 + \sin\theta$	1
2	$\sin^2\theta + 2\sin\theta\cos\theta + \cos^2\theta + \sin^2\theta - 2\sin\theta\cos\theta + \cos^2\theta$ State or clearly use $\sin^2\theta + \cos^2\theta = 1$ Correctly obtain answer of 2	1 1 1 **(AG)**
3	$\tan x = -1$ $x = 135^\circ$	1 1
4	$\frac{x}{2} + 115^\circ = 120$ $x = 10^\circ$ $x = 250^\circ$	1 1 1
5 (a)	Replace $\sin^2\theta$ with $1 - \cos^2\theta$ $\quad \frac{1-\cos^2\theta}{1+\cos\theta}$ Factorise numerator and cancel $1 + \cos\theta$ to obtain $1 - \cos\theta$	1 1 **(AG)**
5 (b)	$1 - \cos\theta + 3\cos^2\theta = 3$ $3\cos^2\theta - \cos\theta - 2 = 0$ $\cos\theta = -2/3$ or 1 $\theta = 131.8^\circ, 0^\circ$ $\theta = 228.2^\circ, 360^\circ$	1 1 1 1 1
6	$\tan x = \frac{4}{5}$ $x = 38.7°$ $x = 218.7°$	1 1 1
7	$2x - 60^\circ = 30^\circ$ $x = 45^\circ$ $x = 105^\circ$ $x = 225^\circ, x = 285^\circ$	1 1 1 1

8 (a)	$\tan x = \frac{3}{7}$ $x = 23.2^\circ$ $x = 203.2^\circ$	1 1 1
8 (b)	Maximum $(90^\circ, k)$ Minimum $(270^\circ, -k)$	1 1
9	Replace $\tan\theta$ with $\frac{\sin\theta}{\cos\theta}$ $\quad \frac{\sin^2\theta}{\cos\theta(1+\cos\theta)}$ Replace $\sin^2\theta$ with $1 - \cos^2\theta$ $\quad \frac{1-\cos^2\theta}{\cos\theta(1+\cos\theta)}$ Factorise numerator $\quad \frac{(1+\cos\theta)(1-\cos\theta)}{\cos\theta(1+\cos\theta)}$ Obtain $\frac{1}{\cos\theta} - 1$	1 1 1 1 **(AG)**