

Trigonometric Identities

For AQA Level 2 Certificate in Further Mathematics (8365)

Name _____

Total marks: **24**

Answer **all** questions in the spaces provided. Show your working: marks are given for correct method. You may use a calculator.

1 Circle the expression that is identical to $1 - \cos^2 \theta$

[1 mark]

$\sin \theta$

$\sin^2 \theta$

$(1 - \cos \theta)^2$

$\tan^2 \theta$

2 Simplify

(a) $\tan \theta \cos \theta$

[1 mark]

Answer _____

(b) $5 - 5 \cos^2 \theta$

[1 mark]

Answer _____

(c) $\frac{\sin^2 \theta}{1 - \sin^2 \theta}$

[1 mark]

Answer _____

3 A is an acute angle.

$$\sin A = \frac{2}{5}$$

(a) Work out the exact value of $\cos A$.

[2 marks]

Answer _____

(b) Work out the exact value of $\tan A$.

Give your answer with a rational denominator.

[2 marks]

Answer _____

4 Write $\cos^2 \theta - 4 \sin \theta + 2$ in the form $a \sin^2 \theta + b \sin \theta + c$ where a , b and c are integers.

[2 marks]

Answer _____

5 Show that $\frac{1 - \cos^2 \theta}{\sin \theta \cos \theta} \equiv \tan \theta$

[2 marks]

6 Prove that $\tan \theta + \frac{1}{\tan \theta} \equiv \frac{1}{\sin \theta \cos \theta}$

[3 marks]

7 θ is an angle between 180° and 270°
 $\tan \theta = 2\sqrt{6}$
Work out the exact value of $\cos \theta$.

[3 marks]

Answer _____

8 Show that $\frac{\cos^2 \theta}{1 + \sin \theta} + 2 \sin \theta \equiv 1 + \sin \theta$

[3 marks]

- 9 The equation $6 \cos^2 x + \sin x = 5$ can be written in the form

$$(3 \sin x + a)(2 \sin x + b) = 0$$

where a and b are integers.

Work out the values of a and b .

You must show your working.

[3 marks]

$a =$ _____ $b =$ _____