

Lesson 9

Additional Mathematics
A-Level Pure Mathematics : Year 1
Trigonometry IV

9.1 Test

*Any solution based entirely on graphical
or numerical methods is not acceptable*

Marks Available : 50

Question 1

- (a) (i) Sketch the graph of $y = \cos x$ over the interval $0^\circ \leq x \leq 360^\circ$

[2 marks]

- (ii) Correctly place 0° , 90° , 180° , 270° , and 360° on the x -axis.

[1 mark]

- (iii) Correctly place -1 , 0 , and $+1$ on the y -axis

[1 mark]

- (b) Calculate the values of x in the domain $0^\circ \leq x \leq 360^\circ$ for which

$$\cos x = -0.728$$

[4 marks]

Question 2

You are given that

$$\sin x = \frac{5}{6}$$

with $0^\circ < x < 90^\circ$

- (a) Use the identity $\cos^2 x + \sin^2 x = 1$ to find an **exact** value for $\cos x$ and, if appropriate, simplify your answer.

[3 marks]

- (b) Use the identity $\tan x = \frac{\sin x}{\cos x}$ and your part (a) answer to find an **exact** value for $\tan x$ and, if appropriate, simplify your answer.

[3 marks]

Question 3

Find the four values of x in the domain $0^\circ < x < 360^\circ$ that satisfy the equation

$$\sin(2x) = \frac{3}{4}$$

Give your answers to 1 decimal place.

[5 marks]

Question 4

Solve, for $0^\circ \leq x < 360^\circ$

$$\cos^2 x = \frac{2}{3}$$

[5 marks]

Question 5

(a) Show that the equation

$$7 \sin^2 x - 19 \cos x - 1 = 0$$

can be written as

$$7 \cos^2 x + 19 \cos x - 6 = 0$$

[3 marks]

(b) Hence solve, for $0^\circ \leq x \leq 720^\circ$

$$7 \sin^2 x - 19 \cos x - 1 = 0$$

giving your answers to 1 decimal place.

[6 marks]

Question 6

Solve, for $0^\circ < x < 360^\circ$

$$\tan x (\tan x + 4) = 5$$

[6 marks]

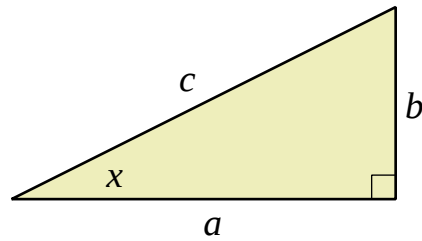
Question 7

Solve for $0^\circ \leq x \leq 360^\circ$

$$4 \cos x = 15 \tan x$$

[6 marks]

Question 8



Using the triangle, or otherwise, prove that, for $0^\circ \leq x \leq 90^\circ$

$$\tan^2 x - \sin^2 x - \tan^2 x \times \sin^2 x = 0$$

[5 marks]

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Teachers may obtain detailed worked solutions to the exercises by email from MHHShrewsbury@Gmail.com