

Trigonometric Equations

- 1 Solve the following equations for θ , giving your answers to 3 significant figures where appropriate, in the intervals indicated:
- | | |
|--|---|
| <p>a $\sqrt{3} \tan \theta - 1 = 0, -\pi \leq \theta \leq \pi$</p> <p>c $8 \cos \theta = 5, -2\pi \leq \theta \leq 2\pi$</p> <p>e $0.4 \tan \theta - 5 = -7, 0 \leq \theta \leq 4\pi$</p> | <p>b $5 \sin \theta = 1, -\pi \leq \theta \leq 2\pi$</p> <p>d $3 \cos \theta - 1 = 0.02, -\pi \leq \theta \leq 3\pi$</p> <p>f $\cos \theta - 1 = -0.82, \frac{\pi}{2} \leq \theta \leq \frac{7\pi}{3}$</p> |
|--|---|
- 2 Find, for $0 \leq x \leq 2\pi$, all the solutions of $\cos^2 x - 1 = \frac{7}{2} \sin^2 x - 2$ giving each solution to one decimal place. **(6 marks)**
- 3 Show that the equation $8 \sin^2 x + 4 \sin x - 20 = 4$ has no solutions. **(3 marks)**
- 4 a Show that the equation $\tan^2 x - 2 \tan x - 6 = 0$ can be written as $\tan x = p \pm \sqrt{q}$ where p and q are numbers to be found. **(3 marks)**
b Hence solve, for $0 \leq x \leq 3\pi$, the equation $\tan^2 x - 2 \tan x - 6 = 0$ giving your answers to 1 decimal place where appropriate. **(5 marks)**
- 5 In the triangle ABC , $AB = 5$ cm, $AC = 4$ cm, $\angle ABC = 0.5$ radians and $\angle ACB = x$ radians.
a Use the sine rule to find the value of $\sin x$, giving your answer to 3 decimal places. **(3 marks)**
Given that there are two possible values of x ,
b find these values of x , giving your answers to 2 decimal places. **(3 marks)**

1

a $-\frac{5\pi}{6}, \frac{\pi}{6}$

b 0.201, 2.94

c -5.39, -0.896, 0.896, 5.39

d -1.22, 1.22, 5.06, 7.51

e 1.77, 4.91, 8.05, 11.2

f 4.89

2

0.7, 2.4, 3.9, 5.6

4

$1 \pm \sqrt{7}$

5

a $\sin x = 0.599$ (3 d.p.)

b 0.64, 2.50