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VCE Mathematical Methods ½
Circular Function II [4.2]
Test

23 Marks. 1 Minute Reading. 23 Minutes Writing.

Results:

Test Questions	_____ / 23

Section A: Test Questions (23 Marks)

Question 1 (3 marks)

State if the following statements are **true** or **false**.

Statement	True	False
a. Trigonometric equations without domain restriction have infinite solutions.		
b. For tangent trigonometric equations, we can always write the answer using one general solution.		
c. For sine trigonometric equations, we can never write the answer using only one general solution.		
d. The equation $\cos(x) = -\frac{1}{2}$ has the general solution $x = \frac{2\pi}{3} \pm 2n\pi$.		
e. The equation $\sin(x) - 2\cos^2(x) + 1 = 0$ can be written as $2\sin^2(x) + \sin(x) - 1 = 0$.		
f. The general solution of the equation $\tan(2x) = 1$, where $x > 0$ is $x = \frac{\pi}{8} + \frac{n\pi}{2}$ for $n \in Z \cup \{0\}$.		

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Question 2 (5 marks)

Solve the following equations for x, over the stated domain.

a. $\tan(3x - \pi) = \sqrt{3}$, for $x \in [0, \pi]$. (2 marks)

b. $2\cos\left(2x - \frac{\pi}{4}\right) - 1 = 0$, for $x \in [0, 2\pi]$. (3 marks)

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Question 3 (6 marks)

Solve the following equations for x:

a. $2\sin\left(2x+\frac{\pi}{3}\right)+1=0.$

b. $\sqrt{3}\tan\left(3x-\frac{\pi}{6}\right)+3=0.$

Question 4 (3 marks)

Solve the following equation for x:

$$2\cos\left(2x-\frac{\pi}{4}\right)=1, \text{for } x \leq 0$$

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Question 5 (6 marks)

Consider the function:

$$f(x) = 2\sin^2(2x) - \sin(2x) - 1$$

a. Solve $f(x) = 0$ for $x \in [0, \pi]$. (4 marks).

b. Hence, find a general solution to $f(x) = 0$. (2 marks)

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VCE Mathematical Methods ½

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