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VCE Mathematical Methods ½
Circular Functions I [4.1]
Test

23 Marks. 1 Minute Reading. 23 Minutes Writing.

Results:

Test Questions	_____ / 23

Section A: Test Questions (23 Marks)

Question 1 (3 marks)

Tick whether the following statements are **True** or **False**.

Statement	True	False
a. The values of sine and cosine functions are always between -1 and 1.		
b. The tangent function is defined as $\tan(x) = \frac{\sin(x)}{\cos(x)}$.		
c. The period of the sine, cosine, and tangent functions is 2π.		
d. The tangent function is undefined at values where the cosine function equals 0.		
e. $\cos(\pi - x) = \cos(x)$ for all x.		
f. If $\sin(x) = \frac{4}{5}$ and x is in the first quadrant, then $\tan\left(\frac{3\pi}{2} - x\right) = \frac{4}{3}$ 0.		

Space for Personal Notes

Question 2 (2 marks)

a. Convert $360°, 1°, 90°, 135°$ to radians. (1 mark)

b. Convert $\pi, 1, \frac{\pi}{3}, \frac{7\pi}{6}$ radians to degrees. (1 mark)

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Question 3 (6 marks)

a. Evaluate $\cos\left(\frac{5\pi}{6}\right)$. (1 mark)

_____

b. Evaluate $\sin\left(\frac{4\pi}{3}\right)$. (1 mark)

_____

c. Evaluate $\tan\left(\frac{3\pi}{4}\right)$. (1 mark)

_____

d. Evaluate $\sin\left(\frac{11\pi}{6}\right)$. (1 mark)

_____

e. Evaluate $\tan\left(-\frac{\pi}{4}\right)$. (1 mark)

_____

f. Evaluate $\cos\left(-\frac{2\pi}{3}\right)$. (1 mark)

_____

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Question 4 (4 marks)

If $\sin(x) = 0.4, \cos(y) = 0.5$, and $\tan(z) = 0.6$, find the value of:

a. $\sin(\pi + x)$. (1 mark)

b. $\tan(\pi - z)$. (1 mark)

c. $\cos\left(\frac{\pi}{2} - x\right)$. (1 mark)

d. $\sin\left(\frac{3\pi}{2} + y\right)$. (1 mark)

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Question 5 (3 marks)

If $\sin(x) = \frac{1}{3}$ and x is in the second quadrant, find the value of:

a. $\cos(5\pi - x)$. (2 marks)

b. $\tan\left(x + \frac{\pi}{2}\right)$. (1 mark)

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Question 6 (5 marks)

Solve the following equations for x over the specified domain.

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

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

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