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VCE Mathematical Methods ½
Linear & Coordinate Geometry [1.1]
Test

17 Marks. 1 Minute Reading. 17 Minutes Writing.

Results:

Test Questions	_____ / 17
Extension	_____ / 4

Section A: Test Questions (17 Marks)

INSTRUCTION: 17 Marks. 17 Minutes Writing.

Question 1 (4 marks)

Tick whether the following statements are **true** or **false.**

Question	True	False
a. The inequality $3x + 5 \leq 9$ has a unique solution.		
b. Midpoint of the two points is always the average of the x and y-values.		
c. Distance between two points is derived from Pythagoras theorem.		
d. Reflecting a point around the $y = 4$ line changes the x-value.		
e. The vertical distance between two points is the difference in their x-values.		
f. The angle measured clockwise between the line and the x-axis is given by $\tan(\theta)$.		
g. For two lines to have infinite solutions, their gradient and y-intercept have to be the same measured clockwise.		
h. The simultaneous equations $2x - 4y = 4$ and $-4x + 8y = -8$ have infinitely many solutions.		

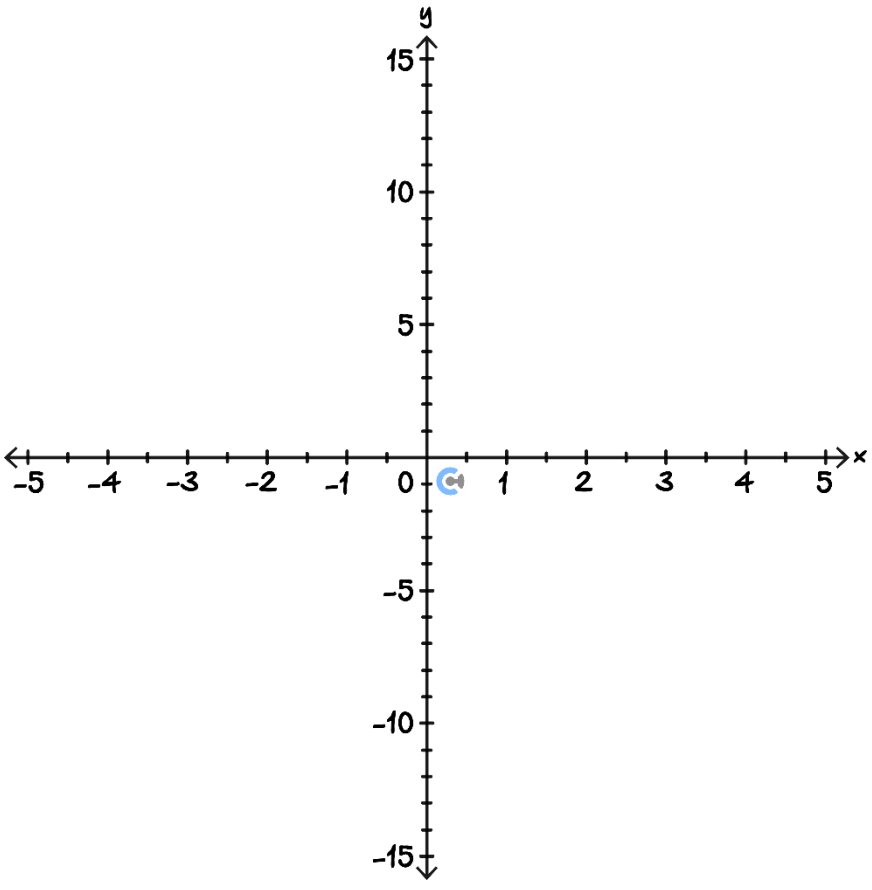
Space for Personal Notes

Question 2 (5 marks)

a. Solve the equation $2x - 3 = 5x + 6$ for x. (1 mark)

b. Solve the inequality $5 - 2x > 3x - 12$ for x. (1 mark)

c. Sketch line governed by the equation $2y - 4x = 4$ on the axis below. Label all axes intercepts. (2 marks)



d. Shade the region described by $2y \geq 4x + 4$ on the axis above. (1 mark)

Question 3 (3 marks)

Given that the distance between point A $(2,1)$ and point B $(k, 4)$ is 5.0 units, find the possible values of k.

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Question 4 (5 marks)

Consider the simultaneous linear equations:

$$\frac{3m}{8}x + 2y = m - 1$$

$$3x + my = 6$$

Where m is a real constant.

a. Find the values of m for which there is a unique solution to the simultaneous equations. (2 marks)

b. Find the value of m for which there are infinitely many solutions. (2 marks)

c. Find the value of m for which there are no solutions. (1 mark)

Space for Personal Notes

Section B: Extension Test Questions (4 Marks)

INSTRUCTION: 4 Marks. 6 Minutes Writing.

Question 5 (4 marks)

Sam is standing at point $A(3, 5)$ and needs to get to a walking path described by the line $y = 3x - 2$. To minimize his effort, he wants to travel the shortest possible distance to the path. What is the shortest distance Sam needs to travel?

a. Find the line perpendicular to $y = 3x - 2$ that passes through $A(3, 5)$. (2 marks)

b. Find the intersection of the line $y = 3x - 2$ and the line from **part a**. (1 mark)

c. Hence, find the shortest distance Sam can travel to reach the walking path. (1 mark)

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VCE Mathematical Methods ½

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