



Core Mathematics C34(GCE)

Practice Question 17

Standard A★

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**CRITICAL THINKING IS THE KEY TO SOLVE REAL WORLD PROBLEMS.
CHILDREN MUST BE TAUGHT HOW TO THINK, NOT WHAT TO THINK.
A GREAT TEACHER WILL BE CREATING STUDENTS TO DO NEW THINGS
THROUGH CRITICAL THINKING, NOT SIMPLY REPEATING WHAT OTHER
GENERATIONS HAVE DONE BEFORE. WE DO NOT NEED ANOTHER
ALBERT EINSTEIN OR ISAAC NEWTON.... WE NEED A PERSON BETTER
THAN THEM.**

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Vectors

Question:

The straight line l has vector equation $\mathbf{r} = (2\mathbf{i} + 7\mathbf{j} + 4\mathbf{k}) + \mu(12\mathbf{i} - 8\mathbf{j} + 20\mathbf{k})$.

Show that another form of vector equation of l is $\mathbf{r} = (65\mathbf{i} - 35\mathbf{j} + 109\mathbf{k}) + \mu(9\mathbf{i} - 6\mathbf{j} + 15\mathbf{k})$.

(4 marks)

Golden Rules

A vector equation of a straight line passing through the point A with position vector \mathbf{a} , and parallel to the vector \mathbf{b} , is

$$\mathbf{r} = \mathbf{a} + \mu\mathbf{b}$$

where μ is a scalar parameter.

A vector equation of a straight line passing through the points C and D , with position vectors \mathbf{c} and \mathbf{d} respectively, is

$$\mathbf{r} = \mathbf{c} + \mu(\mathbf{d} - \mathbf{c})$$

where μ is a scalar parameter.

The acute angle θ between two straight lines is given by

$$\cos \theta = \left| \frac{\mathbf{a} \cdot \mathbf{b}}{|\mathbf{a}||\mathbf{b}|} \right|$$

where \mathbf{a} and \mathbf{b} are direction vectors of the lines.

Traditional or Online classes

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