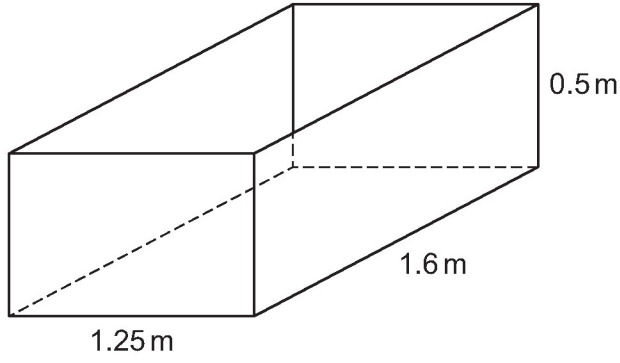
16 (a) Given that

$$\frac{1}{16-9x^2} \equiv \frac{A}{4-3x} + \frac{B}{4+3x}$$

find the values of A and B

[3 marks]

16 (b) An empty container, in the shape of a cuboid, has length 1.6 metres, width 1.25 metres and depth 0.5 metres, as shown in the diagram below.



The container has a small hole in the bottom.

Water is poured into the container at a rate of 0.16 cubic metres per minute.

At time t minutes after the container starts to be filled, the depth of water is d metres and water leaks out at a rate of $0.36d^2$ cubic metres per minute.

At time t minutes after the container starts to be filled, the volume of water in the container is V cubic metres.

16 (b) (i) Show that

$$\frac{\mathrm{d}V}{\mathrm{d}t} = \frac{16-9V^2}{100}$$

[4 marks]

16 (b) (ii) Hence, find t in terms of V

[5 marks]

16 (b) (iii) Determine how long it takes to fill the container with water.

Give your answer to the nearest minute.

[2 marks]