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The length, breadth and height of a room are 8 m 25 cm, 6 m 75 cm and 4 m 50 cm, respectively. Determine the length of the longest rod which can measure the three dimensions of the room exactly.

Solution:

Length = 8 m 25 cm = 825 cm

Breadth = 6 m 75 cm = 675 cm

Height = 4 m 50 cm = 450 cm

The length of the longest rod which can measure the three dimensions of the room exactly is the HCF of 825 cm, 675 cm and 450 cm.

By Euclid's division algorithm

$825 = 675 \times 1 + 150$

$675 = 150 \times 4 + 75$

$150 = 75 \times 2 + 0$

HCF of 825 and 675 is 75.

By Euclid's division algorithm

$450 = 75 \times 6 + 0$

HCF of 450 and 75 is 75.

Hence, the length of the longest rod $= 75 \; cm$