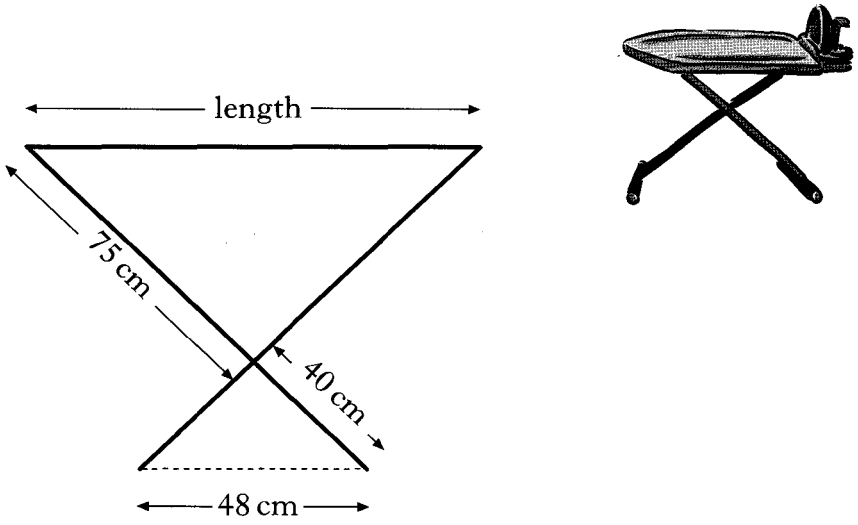
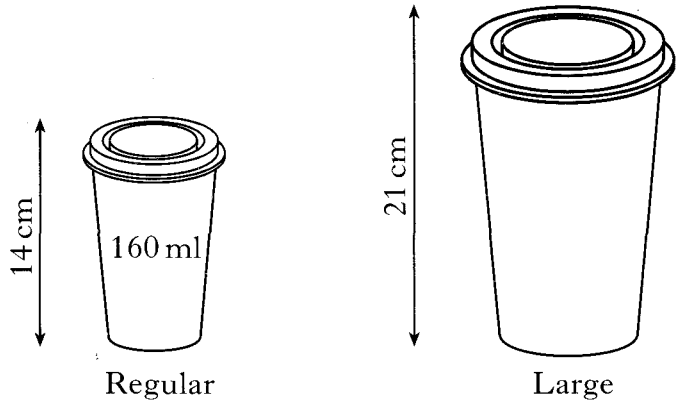
Similarity

2007 P1	**8.** Mick needs an ironing board. He sees one in a catalogue with measurements as shown in the diagram below.  When the ironing board is set up, two similar triangles are formed. Mick wants an ironing board which is at least 80 centimetres in length. Does this ironing board meet Mick's requirements? **Show all your working.**		3
Ans	*Yes, since 90cm is greater than the required 80cm.*		

2006 P1	**7.** Coffee is sold in regular cups and large cups. The two cups are mathematically similar in shape.  Regular Large The regular cup is 14 centimetres high and holds 160 millilitres. The large cup is 21 centimetres high. Calculate how many millilitres the large cup holds.	4	
Ans	540ml		

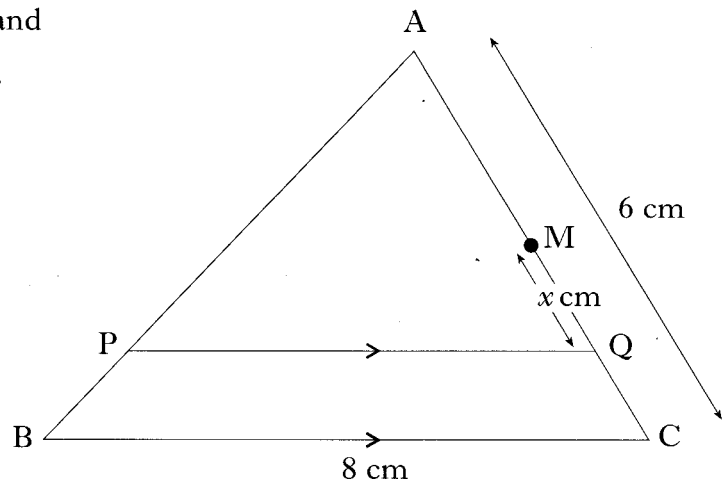
2006 P2

11. In triangle ABC,

BC = 8 centimetres,

AC = 6 centimetres and

PQ is parallel to BC.



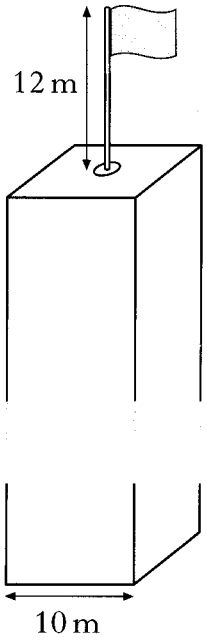
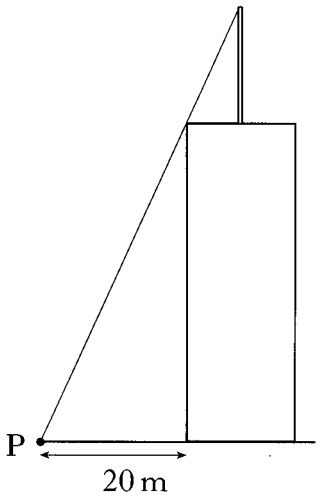
M is the midpoint of AC.

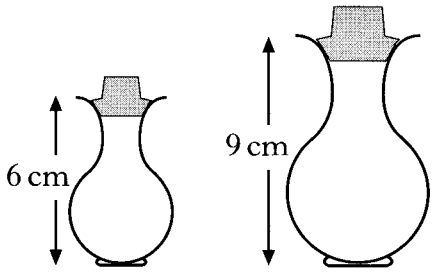
Q lies on AC, x centimetres from M, as shown on the diagram.

(*a*) Write down an expression for the length of AQ. 1

(*b*) Show that PQ = $(4 + \frac{4}{3}x)$ centimetres. 3

Ans (a) (3 + x) cm (b) Proof

2005 P2	**6.** A vertical flagpole 12 metres high stands at the centre of the roof of a tower. The tower is cuboid shaped with a square base of side 10 metres.  At a point P on the ground, 20 metres from the base of the tower, the top of the flagpole is just visible, as shown. Calculate the height of the tower. 		4
Ans	48m		

2003 P2	**9.** Two perfume bottles are mathematically similar in shape.  The smaller one is 6 centimetres high and holds 30 millilitres of perfume. The larger one is 9 centimetres high. What volume of perfume will the larger one hold?	3	
Ans	101.25ml		

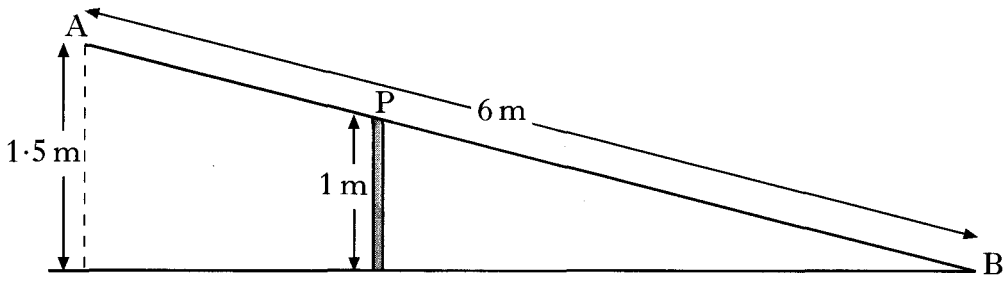
2002 P2

12. A metal beam, AB, is 6 metres long.

It is hinged at the top, P, of a vertical post 1 metre high.

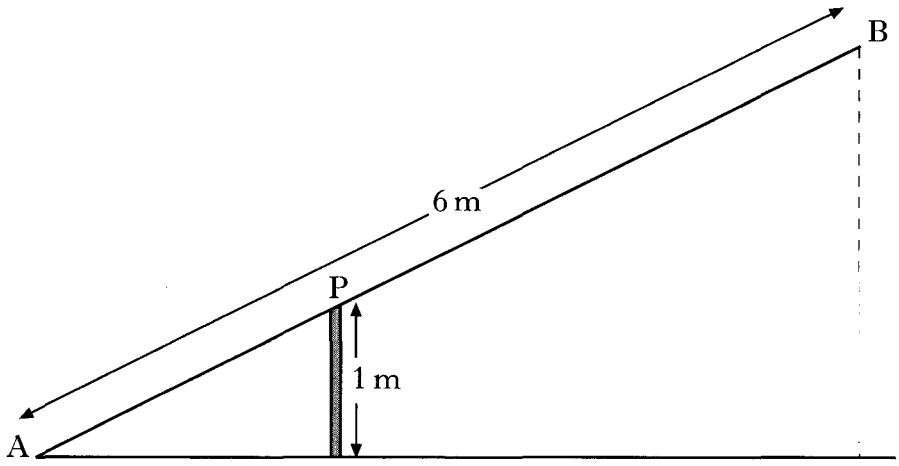
When B touches the ground, A is 1·5 metres above the ground, as shown in Figure 1.

Figure 1



When A comes down to the ground, B rises, as shown in Figure 2.

Figure 2



By calculating the length of AP, or otherwise, find the height of B above the ground.

Do not use a scale drawing.

5

Ans 3m