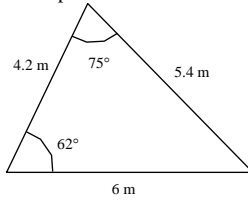
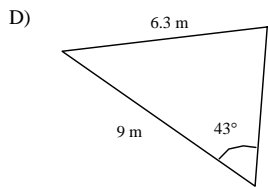
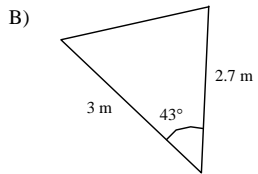
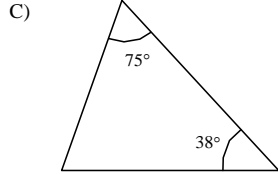
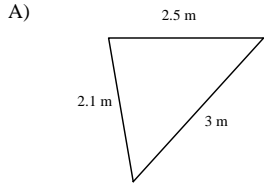


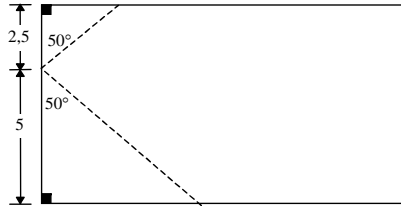
1 The designer for a shipping company has to reproduce models of sails similar to the one below.



According to the given information, which one is similar to the original model?



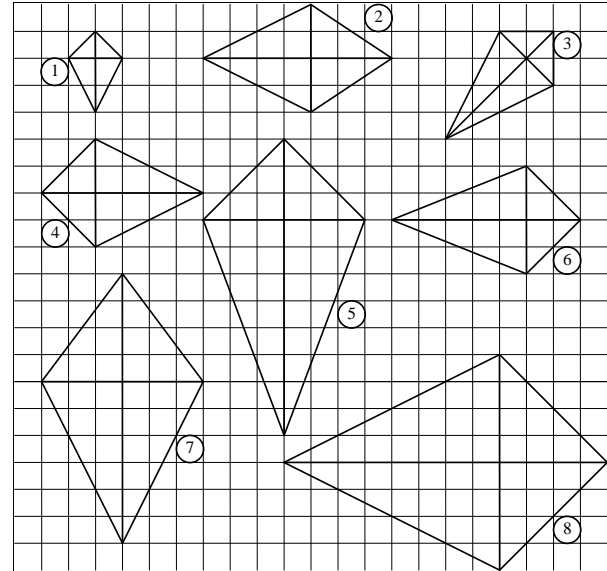
2 The broken line in the figure below represents the path of a ball on a billiard table. This path forms two triangles with the sides of the table.



Which of the following justifies the similarity of the two triangles?

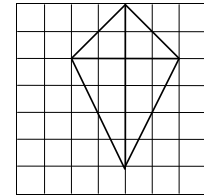
- A) The two triangles each have one right angle.
- B) The two triangles have one congruent angle bounded by two corresponding proportional sides.
- C) The two triangles have two corresponding proportional sides.
- D) The two triangles have three corresponding congruent angles.

3 Several different kites are illustrated below.



Which three kites are similar to the one at the right?

- A) 1, 2 and 3
- B) 1, 4 and 8
- C) 3, 5 and 7
- D) 4, 5 and 6



4 An Olympic athlete warms up for the javelin throw by throwing 2 balls full of sand.

The large ball contains 8 times as much sand as the small one.

What is the ratio of the radius of the small ball to that of the large ball?

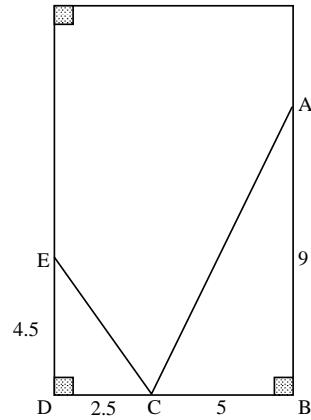
5 Which of the following statements are TRUE?

1. All cubes are similar.
2. All right pyramids whose base is 100 cm^2 and whose height is 8 cm are isometric.
3. If the dimensions of two right prisms with rectangular bases are respectively 4 cm by 5 cm by 6 cm and 3 cm by 4 cm by 10 cm, these prisms are equivalent.

- A) 1, 2 and 3 C) 1 and 3 only
 B) 1 and 2 only D) 2 and 3 only

6 Charles is playing billiards with his friends. According to him, the path taken by the yellow ball forms two similar triangles ABC and EDC.

What reason can be used to justify his statement?



7 Two rectangles are similar. The ratio of their areas is $\frac{1}{16}$.

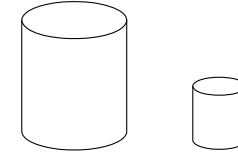
What is the ratio of the corresponding sides?

8 A child has two beach balls. The volume of ball B is 27 times greater than that of ball A.



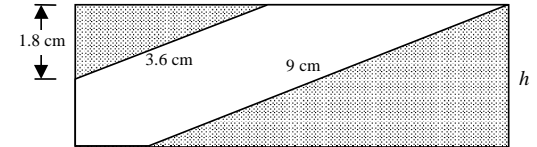
What is the ratio of the radius of ball A to that of ball B?

9 The two cylindrical food cans in the diagram below are similar. The diameter of the smaller can is equal to the radius of the larger can.



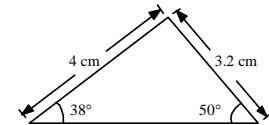
How many of these smaller cans could you fill with the contents of the larger can?

10 Two similar triangles are drawn on a rectangular label.

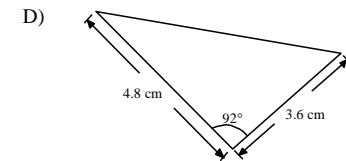
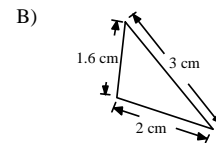
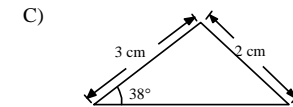
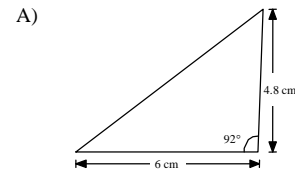


What is the height h of the label?

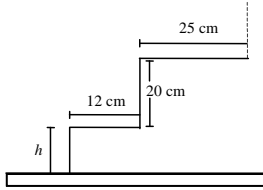
11 One of the triangles below is similar to the one shown at the right.



Which triangle is it?

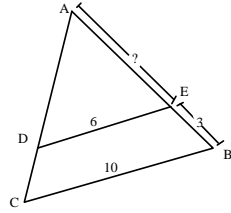


- 12 An old staircase has 10 similar steps. The bottom step is not the same height as the other 9. The following diagram shows the bottom two steps.



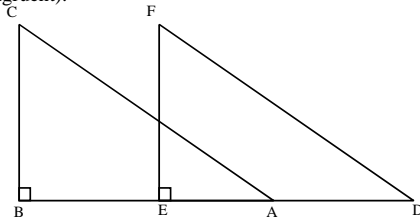
According to this information, what is the height of the bottom step?

- 13 In the figure to the right, segments DE and CB are parallel and they measure 6 units and 10 units respectively. Segment EB measures 3 units.



What is the measure of segment AE?

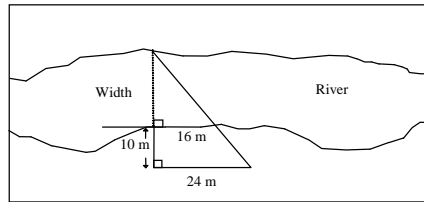
- 14 Right triangles ABC and DEF are isometric (congruent).



If $m \overline{AC} = 20$ cm
 $m \overline{EF} = 10$ cm
 $m \overline{EA} = 7$ cm

What is the length of \overline{AD} to the nearest tenth?

- 15 To find the width of a river at a certain point, Julian draws the following diagram:



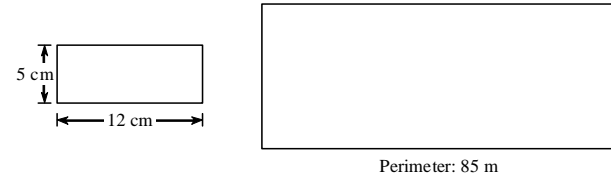
What is the width of the river?

- 16 A large piece of metal with a volume of 3768 cm^3 is completely melted to produce small pieces. The large piece is in the shape of a cylinder and all the small pieces being produced are similar to it. The area of the base of the large piece is 314 cm^2 and that of each small piece is 78.5 cm^2 .

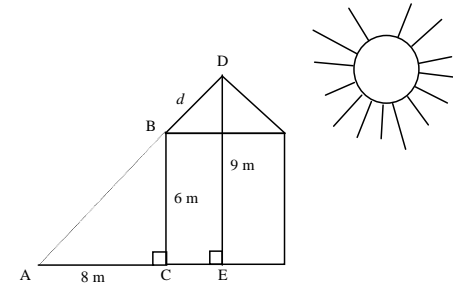
How many small pieces can be produced from the large one?

- 17 The two rectangles shown below are similar. The smaller rectangle measures 5 cm by 12 cm. The perimeter of the larger rectangle is 85 cm.

What is the area of the larger rectangle?



- 18 To find the length d of the roof of a warehouse that is to be repaired, John uses the measurements illustrated in the diagram below.

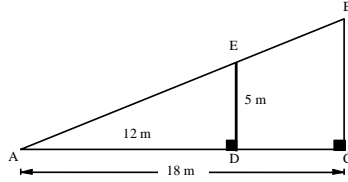


Find length d .
 Show all the work you have done to solve this problem.

19 In triangle ABC illustrated below, angle C = 90°.

In this triangle, segment AC measures 18 m; segment ED is perpendicular to segment AC and measures 5 m; segment AD measures 12 m.

Triangle AED and ABC are similar.

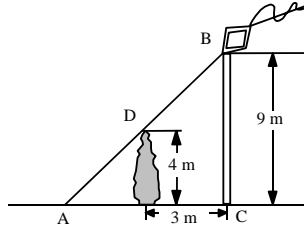


What is the area of triangle ABC?
Show your work.

20 A kite is hanging from the top of a 9 m electric pole. A 4 m hedge planted 3 m from the pole forces Andy to place the foot of the ladder a certain distance in front of the hedge.

What is the distance \overline{AE} from the foot of the ladder to the hedge?

Show all your work and explain your statements.

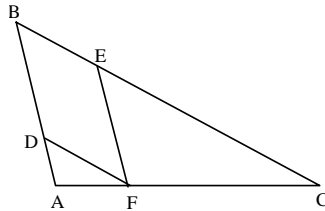


21 In triangle ABC shown on the right,

- $\overline{DF} \parallel \overline{BC}$
- $\overline{EF} \parallel \overline{AB}$
- $m \overline{AD} = 5 \text{ cm}$
- $m \overline{DB} = 15 \text{ cm}$
- $m \overline{DF} = 10 \text{ cm}$
- $m \overline{AF} = 7.5 \text{ cm}$

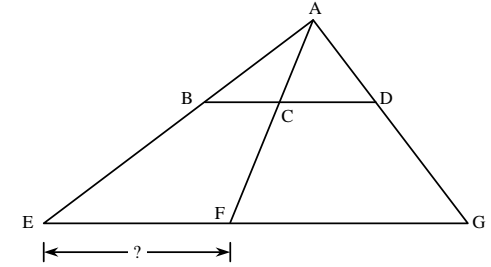
What is the perimeter of triangle EFC?

Show all your work.



22 In the figure on the right,

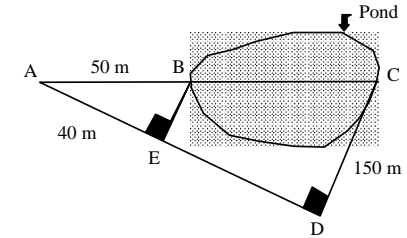
- $\overline{BD} \parallel \overline{EG}$,
- $m \overline{AC} = 26 \text{ cm}$,
- $m \overline{AD} = 30 \text{ cm}$,
- $m \overline{BC} = 14 \text{ cm}$ and
- $m \overline{DG} = 45 \text{ cm}$.



What is the length of segment EF?

Show all your work.

23 Find the length BC of the pond using the technique shown in the following diagram.



Show all your work.