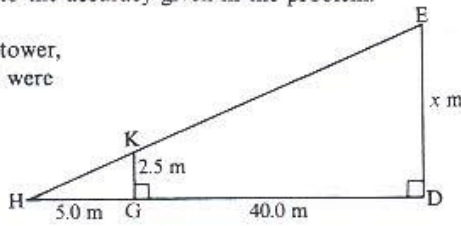


## 12.2 Exercise - Similar Triangles (Applications)

**A** Express the answer to each problem to the accuracy given in the problem.

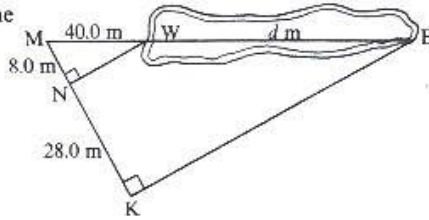
- 1 In order to find the height,  $DE$ , of a tower, the measurements shown at the right were made.

- (a) Which triangles are similar?  
 (b) Write an equation to find  $x$ .  
 (c) How tall is the tower?



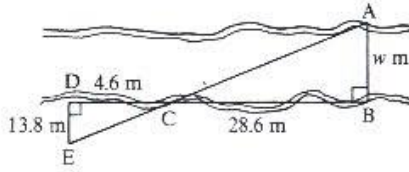
- 2 To calculate the length,  $WE$ , of a pond the measurements shown at the right were taken.

- (a) Which triangles are similar?  
 (b) Write an equation to find  $d$ .  
 (c) How long is the pond?



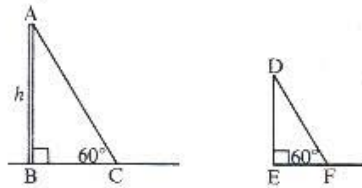
- 3 To find the width,  $AB$ , of a river the following measurements were made.

- (a) Which triangles are similar?  
 (b) Write an equation to find  $w$ .  
 (c) How wide is the river?



- 4 To calculate the height,  $AB$ , of the pole, a scale diagram was drawn.

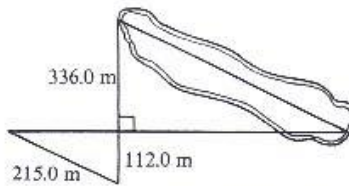
- (a) Why is  $\triangle DEF \sim \triangle ABC$ ?  
 (b) If  $BC = 24.0$  m,  $DE = 4.2$  cm,  $EF = 2.4$  cm, find the height,  $h$ .



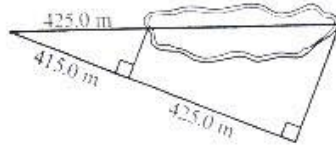
**B** Remember: Plan your solution. Refer to the *Problem-Solving Plan* to help you.



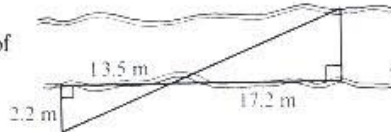
- 5 To find the length of a pond, the following measurements were made. How long is the pond?



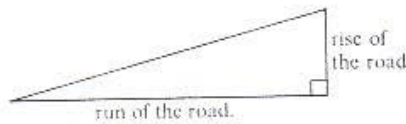
- 6 To find the length of a small lake the following measurements were made. How long is the lake?



- 7 To find the width of a strait, the following measurements were made. Find the width of the strait.



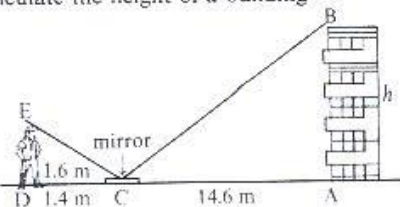
- 8 The following terms are used, not only in analytic geometry but also in road construction. A mountain road rises 4.3 m for every 18.2 m of run. Calculate the rise of the road for a run of 1.0 km.



- 9 (a) On a sunny day, the shadow of a tower is 28.5 m long, while the length of the shadow of a pole, 2.3 m in height, is 1.8 m. Find the height of the tower.  
 (b) The shadow of a metre stick is 1.8 m in length when the shadow of an apartment building is 106.0 m. Calculate the height of the apartment building.  
 (c) A ski tow rises 36.0 m for a run of 100.0 m. How far would you have risen after 40.0 m of run?

- 10 The following procedure can be used to calculate the height of a building or a tree. A mirror is placed on the ground so that the reflection of the top of the building is seen.

- (a) Which triangles are similar?  
 (b) Use the measures in the diagram. Calculate the height of the building.



### SOLUTIONS

12.2 Exercise, page 444

1a)  $\triangle HGK \sim \triangle HDE$  b)  $\frac{h}{2.5} = \frac{45.0}{40.0 + d}$  c) 22.5 m

2a)  $\triangle MNW \sim \triangle MKE$  b)  $\frac{40.0}{40.0 + d} = \frac{36.0}{28.0}$

c) 140.0 m 3a)  $\triangle CDE \sim \triangle CBA$  b)  $\frac{w}{13.8} = \frac{28.6}{4.6}$

c) 85.8 m 4b) 42.0 cm 5. 645.0 m 6. 435.2 m 7. 2.8 m

8. 236.3 m 9a) 36.4 m b) 38.9 m c) 14.4 m 10a)  $\triangle CDE \sim \triangle CAB$  b) 16.7 m 11. 130 m 12a) 107.8 m

- 11 At eye level, 1.5 m above the ground, it is possible to see the top of a building just over the top of a tree when standing 20.0 m from the tree. If the tree is 11.5 m tall and the building is 66.5 m tall, how far is the building from the viewpoint?

- C 12 (a) A plane climbs 30.0 m for every 100.0 m of run. If the speed of the plane is 225.0 km/h, find how high the plane will be in 6.0 s.  
 (b) What assumption do you make in finding your answer in (a)?