

Worksheet 9.1C

Objective: To solve problem involving gradient/inclination on a contour map.

1.

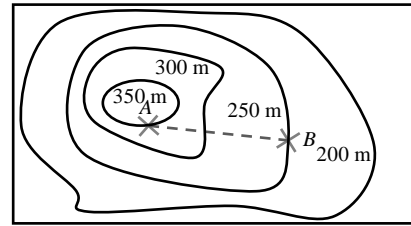
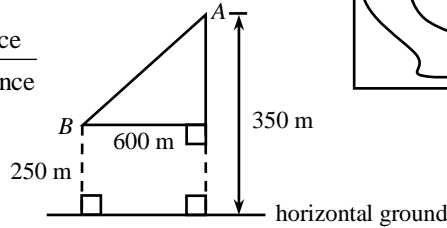
Demonstration

The figure shows a contour map. If the actual horizontal distance of the straight road AB is 600 m, find the gradient of AB .

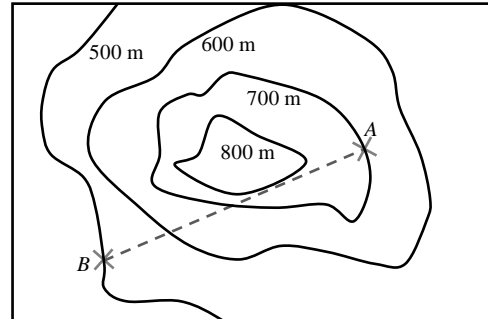
Solution

$$\begin{aligned} \text{Actual vertical distance of } AB &= (350 - 250) \text{ m} \\ &= 100 \text{ m} \end{aligned}$$

$$\begin{aligned} \text{Gradient of } AB &= \frac{\text{actual vertical distance}}{\text{actual horizontal distance}} \\ &= \frac{100 \text{ m}}{600 \text{ m}} \\ &= \frac{1}{6} \end{aligned}$$



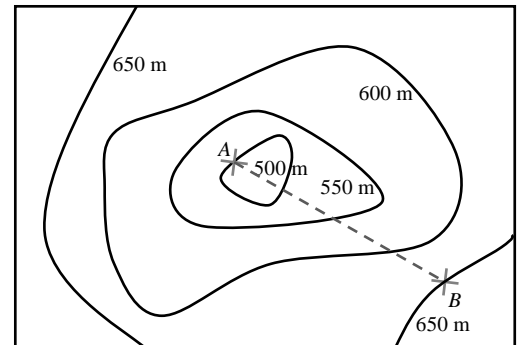
The figure shows a contour map. If the actual horizontal distance of the cable connecting A and B is 840 m, find the average gradient of the cable.



2. The figure shows a contour map. The actual horizontal distance between A and B is 600 m.

(a) Find the gradient of AB .

(b) Find the inclination of AB , correct to the nearest degree.

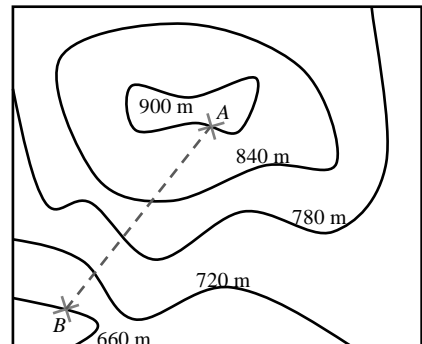


3. The figure shows a contour map. Suppose AB is a straight road. The actual horizontal distance between A and B is 720 m.

(a) Find the inclination of AB .

(b) Find the actual length of the cable connecting A and B .

(Give the answers correct to 3 significant figures.)



4. Demonstration

The scale of the contour map shown is 1 : 8000. The length of AB is measured as 2 cm on the map.

- (a) Find the gradient of AB .
 (b) Find the inclination of AB , correct to the nearest degree.

Solution

- (a) Actual vertical distance of $AB = (400 - 300) \text{ m} = 100 \text{ m}$
 Actual horizontal distance of $AB = 2 \times 8000 \text{ cm} = 160 \text{ m}$

$$\text{Gradient of } AB = \frac{100 \text{ m}}{160 \text{ m}} = \frac{5}{8}$$

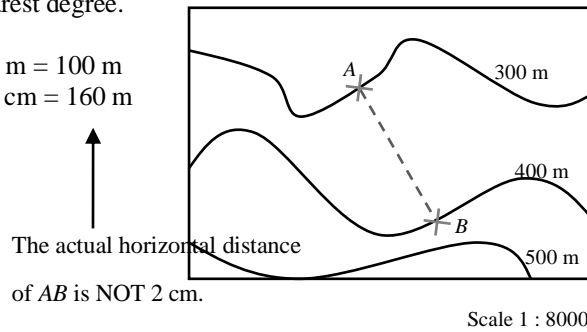
- (b) Let θ be the inclination of AB .

$$\tan \theta = \text{gradient of } AB$$

$$= \frac{5}{8}$$

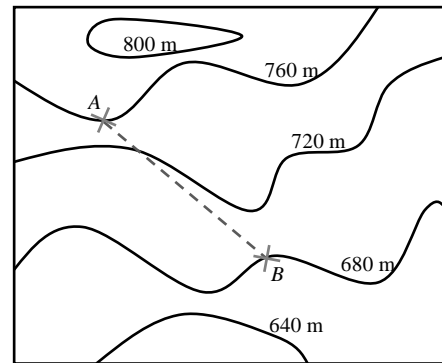
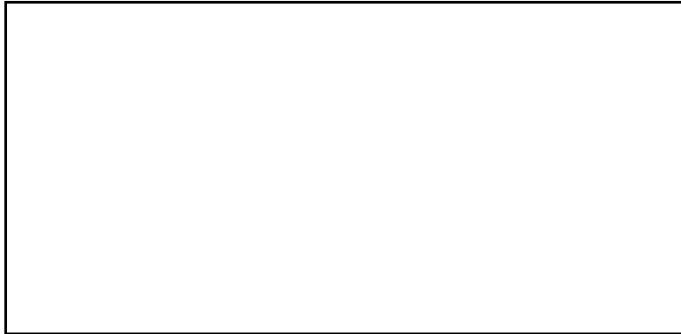
$$\theta = 32^\circ, \text{ cor. to the nearest degree}$$

\therefore The inclination of AB is 32° .



The scale of the contour map shown is 1 : 6000. Suppose AB is a straight road. The length of AB is measured as 2.8 cm on the map.

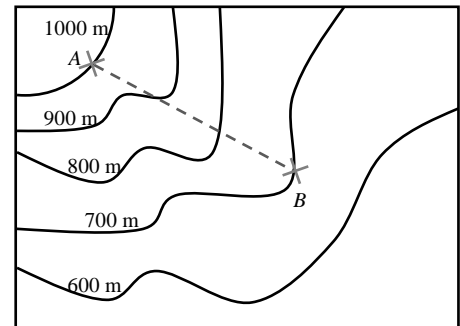
- (a) Find the gradient of AB .
 (b) Find the inclination of AB , correct to 3 significant figures.



Scale 1 : 6000

5. The scale of the contour map shown is 1 : 120 000. Suppose AB is a straight road. The length of AB is measured as 3 cm on the map.

- (a) Find the gradient of AB .
 (b) Find the inclination of AB , correct to 3 significant figures.



Scale 1 : 120 000

Try More

6. The figure shows a contour map. AB is a straight trail with gradient 1 : 8. Find the actual length of AB .
 (Give the answer correct to the nearest 0.1 m.)

