



# INDIAN SCHOOL AL WADI AL KABIR

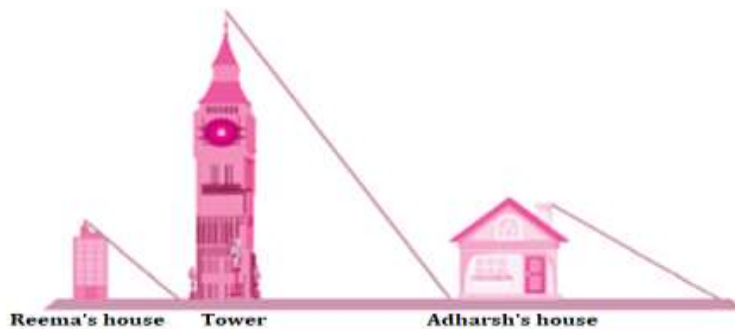
Class X, Mathematics (2023-24)

## Worksheet– TRIANGLES

### CASE STUDY QUESTIONS

#### CASE STUDY A:

Reema is trying to find the average height of a tower near his house. He is using the properties of similar triangles. The height of Reema's house is 20 m when Reema's house casts a shadow 10 m long on the ground. At the same time, the tower casts a shadow 50 m long on the ground and the house of Adarsh casts 20 m shadow on the ground.



Based on the above information, answer the following questions.

Q1.	What is the height of the tower?
Q2.	What will be the length of the shadow of the tower when Reema's house casts a shadow of 12 m?
Q3.	What is the height of Adarsh's house?
Q4.	When the tower casts a shadow of 40 m, same time what will be the length of the shadow of Adarsh's house?
Q5.	When the tower casts a shadow of 40 m, same time what will be the length of shadow of Reema's house?

#### CASE STUDY B:

A scale drawing of an object is the same shape as the object but a different size. The scale of a drawing is a comparison of the length used on a drawing to the length it represents. The scale is written as a ratio. The ratio of two corresponding sides in similar figures is called the scale factor.

$$\text{Scale factor} = \frac{\text{length in image}}{\text{corresponding length in object}}$$

If one shape can become another using resizing, then the shapes are similar. Hence, two shapes are similar when one can become the other after a resize, flip, slide or turn. In the photograph below showing the side view of a train engine. Scale factor is 1:200.

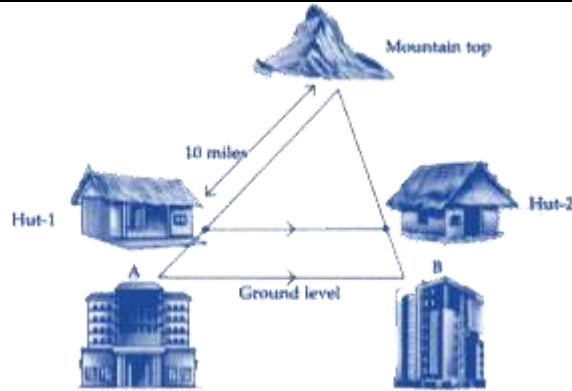


This means that a length of 1 cm on the photograph above corresponds to a length of 200 cm or 2 m, of the actual engine. The scale can also be written as the ratio of two lengths.

Based on the above information, answer the following questions.

Q6.	If the length of the model is 11 cm, then the overall length of the engine in the photograph above, including the couplings(mechanism used to connect) is:
Q7.	What is the actual width of the door if the width of the door in photograph is 0.35cm?
Q8.	If two similar triangles have a scale factor 5 : 3 and the ratio of the altitudes of two triangles are 25 : a, then what is the value of a?
Q9.	<p>The length of AB in the given figure</p>
Q10.	In the above given figure, find the length of BD if AD = 18 cm, BC = 9 cm and DE = 12 cm.

**CASE STUDY C:**Two hotels are at the ground level on either side of a mountain. On moving a certain distance towards the top of the mountain two huts are situated as shown in the figure. The ratio between the distance from hotel B to hut-2 and that of hut-2 to mountain top is 3: 7.

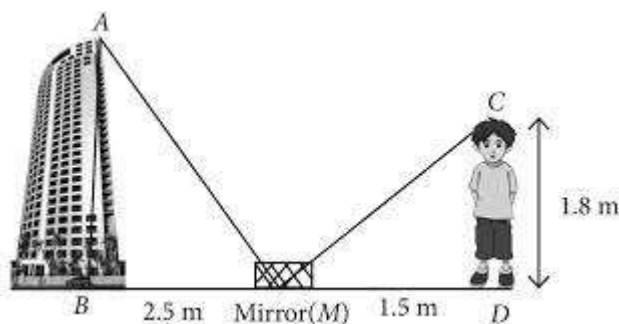


Based on the above information, answer the following questions.

<b>Q11.</b>	What is the ratio of the perimeters of the triangle formed by both hotels and mountain top to the triangle formed by both huts and mountain top?
<b>Q12.</b>	What is the distance between the hotel A and hut-1 ?
<b>Q13.</b>	If the horizontal distance between the hut -1 and hut -2 is 8 miles, then find the distance between the two hotels.
<b>Q14.</b>	If the distance from mountain top to hut-1 is 5 miles more than that of distance from hotel B to mountain top, then what is the distance between hut-2 and mountain top?
<b>Q15.</b>	If the horizontal distance between the hotel A and hotel B is 35 miles, then what is the distance between the two huts?

**CASE STUDY D:**

Rohit's father is a mathematician. One day he gave Rohit an activity to measure the height of building. Rohit accepted the challenge and placed a mirror on ground level to determine the height of building. He is standing at a certain distance so that he can see the top of the building reflected from mirror. Rohit eye level is at 1.8m above ground. The distance of Rohit from mirror and that of building from mirror are 1.5 m and 2.5 m respectively.



Based on the above information, answer the following questions.

<b>Q16.</b>	Find the two similar triangles formed in the above figure.
<b>Q17.</b>	Which criterion of similarity is applied here?
<b>Q18.</b>	What is the height of the building?
<b>Q19.</b>	In $\triangle ABM$ , if $\angle BAM = 30^\circ$ , then what is the value of $\angle MCD$ ?
<b>Q20.</b>	If $\triangle ABM$ and $\triangle CDM$ are similar where $CD = 6$ cm, $MD = 8$ cm and $BM = 24$ cm, then find $AB$ .

### Answers

<b>Answers</b>	<b>1</b>	100 m	<b>2</b>	60 m	<b>3.</b>	40 m	<b>4</b>	16 m
	<b>5</b>	8 m	<b>6</b>	22 m	<b>7</b>	0.7	<b>8</b>	15
	<b>9</b>	4 cm	<b>10</b>	4.5 cm	<b>11</b>	10:7	<b>12</b>	4.29 miles
	<b>13</b>	11.43 miles	<b>14</b>	3.5 miles	<b>15</b>	24.5 miles	<b>16</b>	$\triangle ABM \sim \triangle CDM$
	<b>17</b>	AA Similarity criterion	<b>18</b>	3 m	<b>19</b>	$30^\circ$	<b>20</b>	18 cm