



# INDIAN SCHOOL AL WADI AL KABIR

## Department: Mathematics

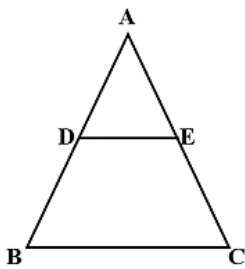
Class X

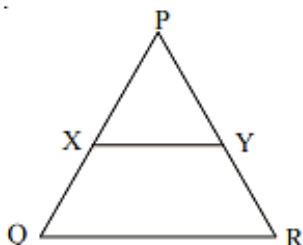
### Worksheet – Triangles

15 – 04 - 2025

#### Questions of 1 mark each

|      |                                                                                                                                                                                        |                                    |   |                                    |   |                                    |   |                                    |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|---|------------------------------------|---|------------------------------------|---|------------------------------------|
| Q.1. | In $\triangle DEW$ , A and B are points on DE and DW respectively and $AB \parallel EW$ . If $AD = 4$ cm, $DE = 12$ cm and $BW = 24$ cm, the value of DB is:                           |                                    |   |                                    |   |                                    |   |                                    |
|      | A                                                                                                                                                                                      | 6 cm                               | B | 8 cm                               | C | 10 cm                              | D | 12 cm                              |
| Q.2. | The perimeters of two similar triangles ABC and LMN are 60 cm and 48 cm respectively. If $LM = 8$ cm, then the length of AB is                                                         |                                    |   |                                    |   |                                    |   |                                    |
|      | A                                                                                                                                                                                      | 10 cm                              | B | 12 cm                              | C | 8 cm                               | D | 6 cm                               |
| Q.3. | In $\triangle ABC$ , D and E are points on AB and AC respectively and $DE \parallel BC$ . If $AD = x$ , $BD = x + 1$ , $AE = x + 3$ and $CE = x + 5$ , the value of x is:              |                                    |   |                                    |   |                                    |   |                                    |
|      | A                                                                                                                                                                                      | -3                                 | B | 3                                  | C | 9                                  | D | -9                                 |
| Q.4. | $\triangle ABC$ and $\triangle PQR$ are similar triangles such that $\angle A = 32^\circ$ and $\angle R = 65^\circ$ , then $\angle B$ is                                               |                                    |   |                                    |   |                                    |   |                                    |
|      | A                                                                                                                                                                                      | $83^\circ$                         | B | $32^\circ$                         | C | $65^\circ$                         | D | $97^\circ$                         |
| Q.5. | In two triangles ABC and PQR, if $\frac{AB}{QR} = \frac{BC}{RP} = \frac{CA}{PQ}$ , then                                                                                                |                                    |   |                                    |   |                                    |   |                                    |
|      | A                                                                                                                                                                                      | $\triangle PQR \sim \triangle CAB$ | B | $\triangle PQR \sim \triangle ABC$ | C | $\triangle PQR \sim \triangle CBA$ | D | $\triangle PQR \sim \triangle BCA$ |
| Q.6. | ABCD is a trapezium in which $AB \parallel DC$ and P, Q are points on AD and BC respectively such that $PQ \parallel DC$ . If $PD = 18$ cm, $BQ = 35$ cm and $QC = 15$ cm, then AD is: |                                    |   |                                    |   |                                    |   |                                    |
|      | A                                                                                                                                                                                      | 55 cm                              | B | 57 cm                              | C | 60 cm                              | D | 42 cm                              |
| Q.7. | In triangles PQR and MST, $\angle P = 55^\circ$ , $\angle Q = 25^\circ$ , $\angle M = 100^\circ$ and $\angle S = 25^\circ$ , then                                                      |                                    |   |                                    |   |                                    |   |                                    |
|      | A                                                                                                                                                                                      | $\triangle QPR \sim \triangle STM$ | B | $\triangle PQR \sim \triangle STM$ | C | $\triangle QPR \sim \triangle MST$ | D | $\triangle PQR \sim \triangle MTS$ |

|      |                                                                                                                                             |   |            |   |            |   |            |  |
|------|---------------------------------------------------------------------------------------------------------------------------------------------|---|------------|---|------------|---|------------|--|
| Q.8. | In fig, in $\triangle ABC$ , $\frac{AD}{BD}$ and $\frac{AE}{CE}$ , $\angle ADE = 70^\circ$ and $\angle ACB = 50^\circ$ then $\angle BAC$ is |   |            |   |            |   |            |  |
|      | <div></div>                                                |   |            |   |            |   |            |  |
| A    | $70^\circ$                                                                                                                                  | B | $50^\circ$ | C | $80^\circ$ | D | $60^\circ$ |  |

|      |                                                                                                 |   |                       |   |                       |   |                       |  |
|------|-------------------------------------------------------------------------------------------------|---|-----------------------|---|-----------------------|---|-----------------------|--|
| Q.9. | In the given figure, $XY \parallel QR$ and $\frac{PX}{XQ} = \frac{PY}{YR} = \frac{1}{2}$ , then |   |                       |   |                       |   |                       |  |
|      | <div></div>   |   |                       |   |                       |   |                       |  |
| A    | $XY = QR$                                                                                       | B | $XY = \frac{1}{3} QR$ | C | $XY = \frac{2}{3} QR$ | D | $XY = \frac{1}{2} QR$ |  |

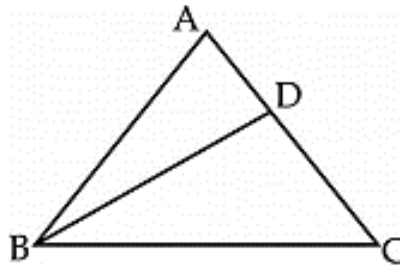
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|-------|--------------------------------------------------------------|-------------------|---|-------------------------|---|---------------------------|---|-----------------------------|
| Q.10. | Which of the following are DEFINITELY similar to each other? |                   |   |                         |   |                           |   |                             |
|       | A                                                            | any two rhombuses | B | any two right triangles | C | any two regular pentagons | D | any two isosceles triangles |

|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |  |  |  |  |  |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|--|
| ASSERTION AND REASONING |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |  |  |  |  |  |
|                         | <p><b>DIRECTION:</b> In question number 11, a statement of <b>Assertion (A)</b> is followed by a statement of <b>Reason (R)</b>. Choose the correct option</p> <p>(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A)</p> <p>(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation of Assertion (A)</p> <p>(c) Assertion (A) is true but reason (R) is false.</p> <p>(d) Assertion (A) is false but reason (R) is true.</p> |  |  |  |  |  |  |  |

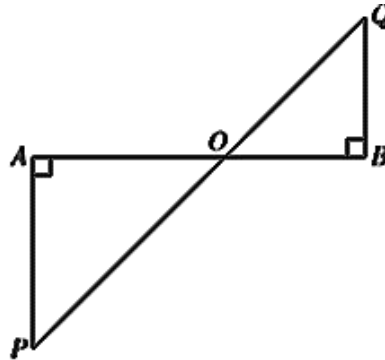
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| Q.11. | <p><b>Assertion:</b> If <math>\triangle ABC</math> and <math>\triangle PQR</math> are congruent triangles, then they are also similar triangles.</p> <p><b>Reason:</b> All congruent triangles are similar but similar triangles need not be congruent.</p> |  |  |  |  |  |  |  |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|--|

**Questions of 2 marks each**

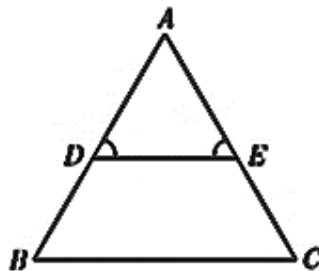
- Q.12.** In the given figure, ABC is a triangle in which  $AB = AC$  and D is a point on AC such that  $BC^2 = AC \times CD$ . Prove that  $BD = BC$ .



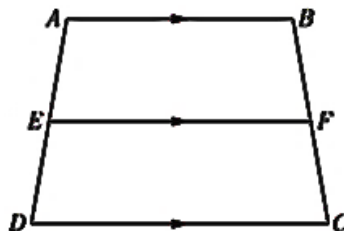
- Q.13.** In the given figure, if  $\angle A = 90^\circ$ ,  $\angle B = 90^\circ$ ,  $OB = 4.5\text{cm}$ ,  $OA = 6\text{ cm}$  and  $AP = 4\text{ cm}$  then find QB.



- Q.14.** In Figure  $\angle D = \angle E$  and  $\frac{AD}{DB} = \frac{AE}{EC}$ , prove that  $\triangle BAC$  is an isosceles triangle.



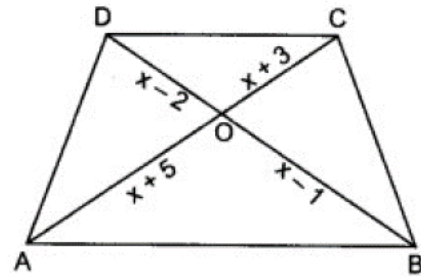
- Q.15.** In the given figure, if ABCD is a trapezium in which  $AB \parallel CD \parallel EF$ , then prove that  $\frac{AE}{ED} = \frac{BF}{FC}$ .



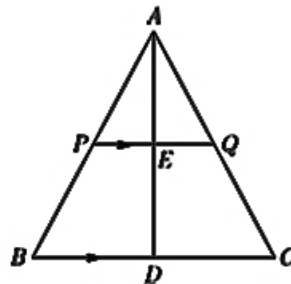
- Q.16.** A vertical stick 12m long casts a shadow 8m long on the ground. At the same time a tower casts the shadow 40m long on the ground. Determine the height of the tower.

**Questions of 3 marks each**

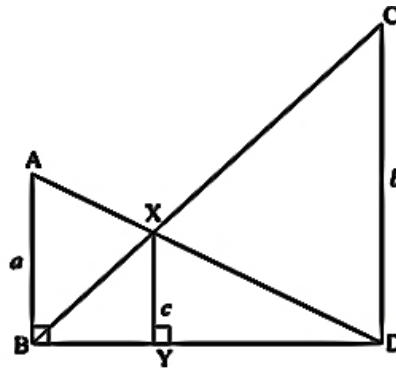
- Q.17.** In the given figure, if  $AB \parallel DC$ , find the length of AC and BD.



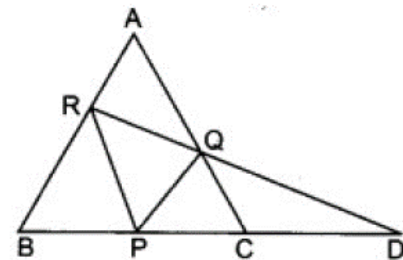
- Q.18.** In a  $\triangle ABC$ , let P and Q be points on AB and AC respectively such that  $PQ \parallel BC$ . Prove that the median AD bisects PQ.

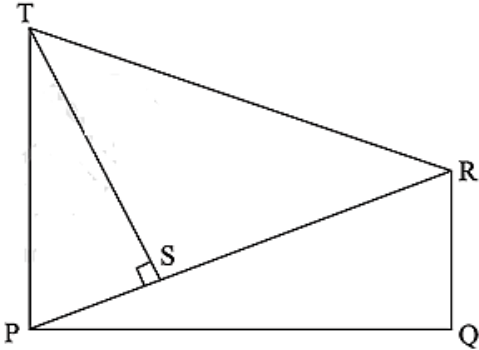


- Q.19.** In the figure, if  $\angle ABD = \angle XYD = \angle CDB = 90^\circ$ .  
 $AB = a$ ,  $XY = c$  and  $CD = b$ , then prove that  $c(a + b) = ab$ .

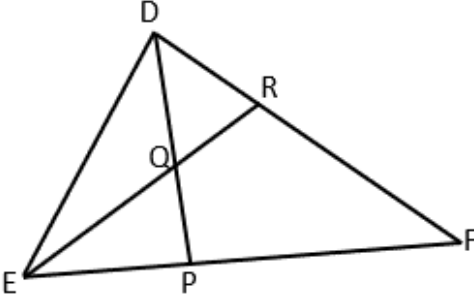


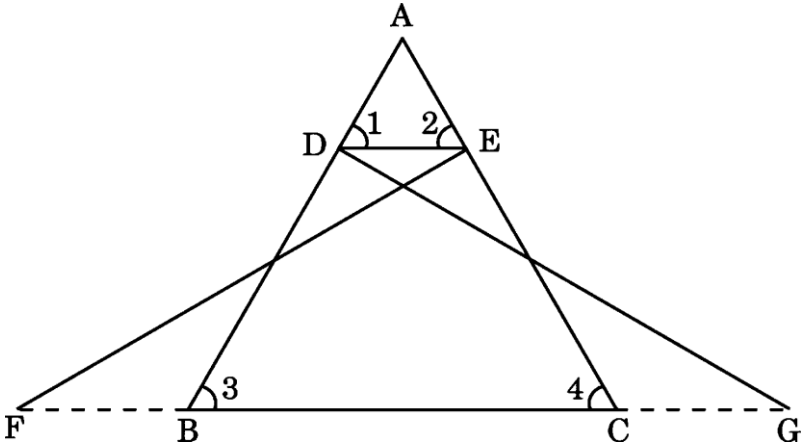
- Q.20.** In the given figure  $PQ \parallel BA$ ;  $PR \parallel CA$ . If  $PD = 12$  cm. Find  $BD \times CD$ .



|       |                                                                                                                                                                                                                                    |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Q.21. | <p>In the given figure, RQ and TP are perpendicular to PQ, also <math>TS \perp PR</math> prove that <math>ST \cdot RQ = PS \cdot PQ</math>.</p>  |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**Questions of 5 marks each**

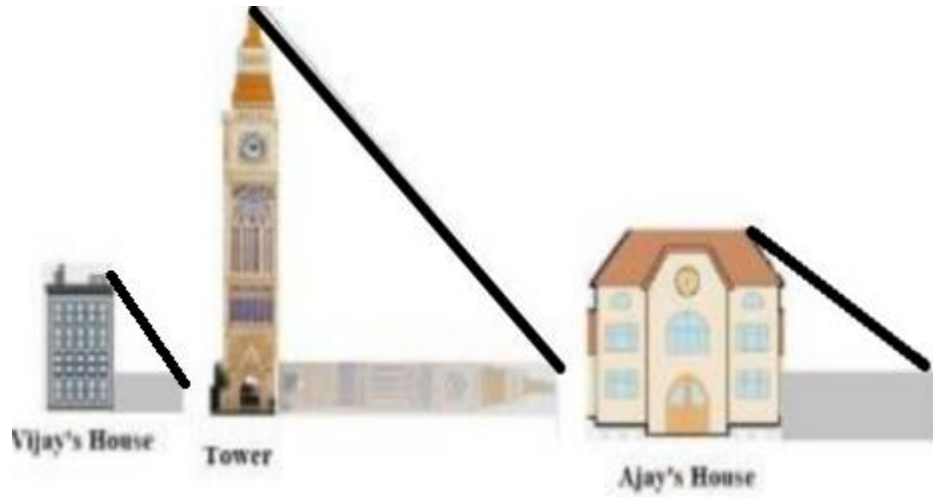
|       |                                                                                                                                                                                                                                                                           |
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| Q.22. | <p>P is the midpoint of EF and Q is the midpoint of DP. If EQ when produced meets DF at R, prove that <math>RD = \frac{1}{3} DF</math>. (Hint: Draw <math>PS \parallel QR</math>)</p>  |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|       |                                                                                                                                                                                                                                                                 |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Q.23. | <p>In the given figure, <math>\triangle FEC \cong \triangle GDB</math> and <math>\angle 1 = \angle 2</math>. Prove that <math>\triangle ADE \sim \triangle ABC</math>.</p>  |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|       |                                                                                                                                                                            |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Q.24. | <p>Through the mid-point M of the side CD of a parallelogram ABCD, the line BM is drawn intersecting AC in L and AD (produced) in E. Prove that <math>EL = 2BL</math>.</p> |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Case study question (4 marks)

- Q.25.** Vijay is trying to find the average height of a tower near his house. He is using the properties of similar triangles. The height of Vijay's house is 20m when Vijay's house casts a shadow 10m long on the ground. At the same time, the tower casts a shadow 50m long on the ground and the house of Ajay casts 20m long shadow on the ground.



Based on the above information, answer the following questions:

- (i) What is the height of the tower?
- (ii) What will be the length of the shadow of the tower when Vijay's house casts a shadow of 12m?
- (iii) What is the height of Ajay's house?
- (iv) When the tower casts a shadow of 40m, at the same time what will be the length of the shadow of Ajay's house?

### ANSWERS

|             |           |             |           |             |            |             |             |             |                     |
|-------------|-----------|-------------|-----------|-------------|------------|-------------|-------------|-------------|---------------------|
| <b>Q.1</b>  | D         | <b>Q.2</b>  | A         | <b>Q.3</b>  | B          | <b>Q.4</b>  | A           | <b>Q.5</b>  | A                   |
| <b>Q.6</b>  | D         | <b>Q.7</b>  | A         | <b>Q.8</b>  | D          | <b>Q.9</b>  | B           | <b>Q.10</b> | C                   |
| <b>Q.11</b> | a         | <b>Q.13</b> | 3 cm      | <b>Q.16</b> | 60m        | <b>Q.17</b> | 22 cm, 11cm | <b>Q.20</b> | 144 cm <sup>2</sup> |
| <b>Q.25</b> | (i) 100 m | <b>Q.25</b> | (ii) 60 m | <b>Q.25</b> | (iii) 40 m | <b>Q.25</b> | (iv) 16m    |             |                     |