



**ICSE Class 10**

**MATHEMATICS**

**SIMILARITY**

**All PYQs from 2010-2023**



**Score 80/80**



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ICSE Class 10

Mathematics

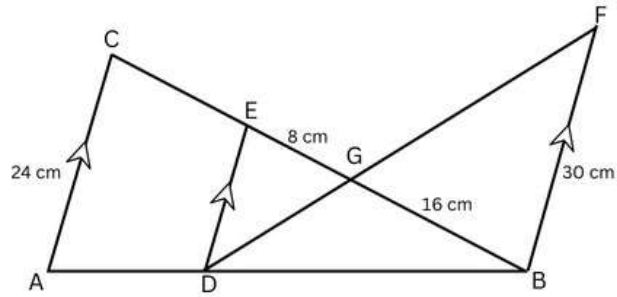
Similarity

Previous Years Questions

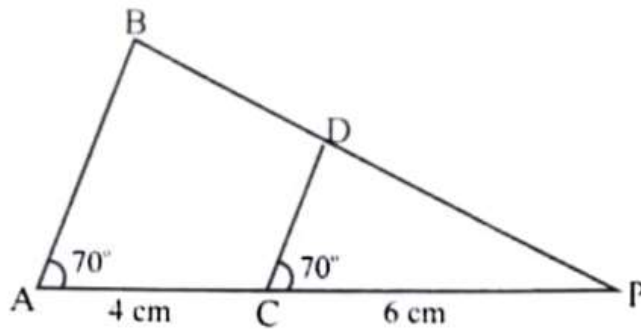
2010-2023

1. In the given figure,  $AC \parallel DE \parallel BF$ . If  $AC = 24$  cm,  $EG = 8$  cm,  $GB = 16$  cm,  $BF = 30$  cm.

- (a) Prove  $\triangle GED \sim \triangle GBF$   
 (b) Find  $DE$   
 (c)  $DB : AB$

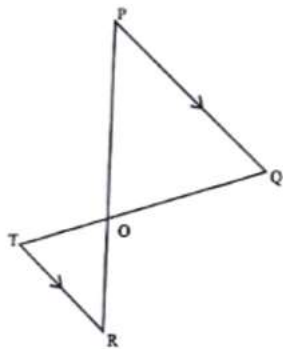


2. In the given figure  $\angle BAP = \angle DCP = 70^\circ$ ,  $PC = 6$  cm and  $CA = 4$  cm, then  $PD : DB$  is



- (a)  $5 : 3$   
 (b)  $3 : 5$   
 (c)  $3 : 2$   
 (d)  $2 : 3$  [2023]

3. In the given figure  $PQ$  is parallel to  $TR$ , then by using condition of similarity: [1]



$$\frac{PQ}{RT} = \frac{OP}{OT} = \frac{OQ}{OR}$$

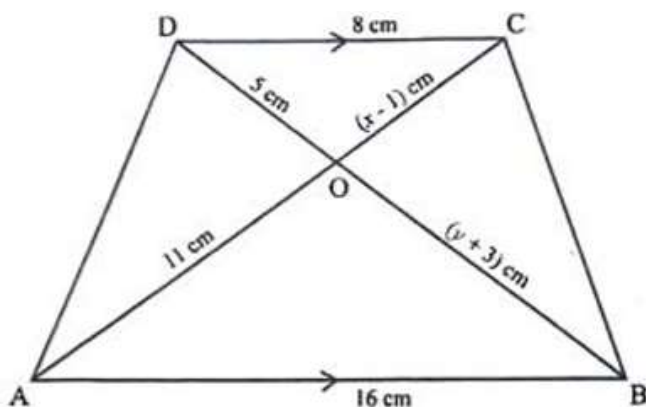
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[2021semester-1]

4. In the given figure ABCD is a trapezium in which DC is parallel to AB. AB = 16 cm and DC = 8 cm. OD = 5 cm, OB = (y + 3) cm, OA = 11 cm and OC = (x - 1) cm. Using the given information answer the following questions. [2021 Semester-I]



(i.) From the given figure name the pair of similar triangles:

- (a)  $\triangle OAB, \triangle OBC$  (b)  $\triangle COD, \triangle AOB$  (c)  $\triangle ADB, \triangle ACB$  (d)  $\triangle COD, \triangle COB$

(ii.) The corresponding proportional sides with respect to the pair of similar triangles obtained in (i):

- (a)  $\frac{CD}{AB} = \frac{OC}{OA} = \frac{OD}{OB}$  (b)  $\frac{AD}{BC} = \frac{OC}{OA} = \frac{OD}{OB}$  (c)  $\frac{AD}{BC} = \frac{BD}{AC} = \frac{AB}{DC}$  (d)  $\frac{OD}{OB} = \frac{CD}{CB} = \frac{OC}{OA}$

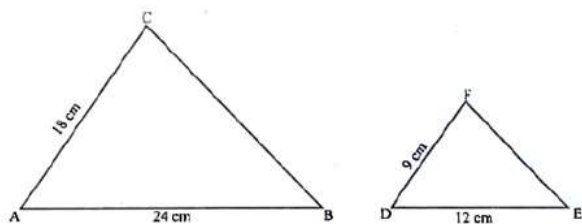
(iii.) The ratio of the sides of the pair of similar triangles is:

- (a) 1 : 3 (b) 1 : 2 (c) 2 : 3 (d) 3 : 1

(iv.) Using the ratio of sides of the pair of similar triangles values of x and y are respectively:

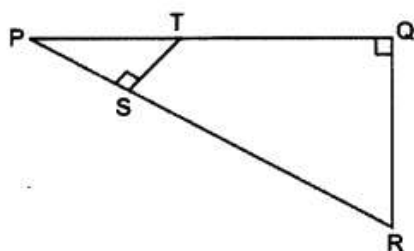
- (a) x = 4.6, y = 7 (b) x = 7, y = 7 (c) x = 6.5, y = 7 (d) x = 6.5, y = 2

5. In the given figure,  $AB = 24$  cm,  $AC = 18$  cm,  $DE = 12$  cm,  $DF = 9$  cm and  $\angle BAC = \angle EDF$ . Then  $\triangle ABC \sim \triangle DEF$  by the condition:



- (a) AAA  
(b) SAS  
(c) SSS  
(d) AAS [2021 Semester-1]

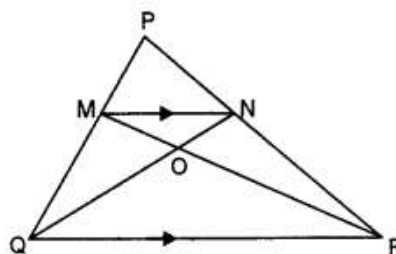
6. In the given figure,  $\angle PQR = \angle PST = 90^\circ$ ,  $PQ = 5$  cm and  $PS = 2$  cm.



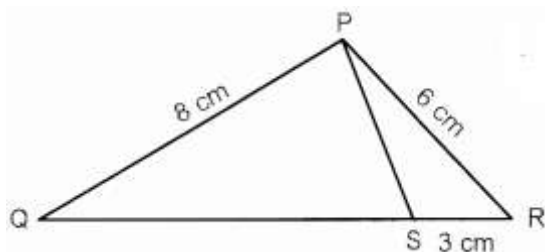
- (i) Prove that  $\triangle PQR \sim \triangle PST$ .  
(ii) Find Area of  $\triangle PQR$ : Area of quadrilateral SRQT. [2019]

7. In  $\triangle PQR$ ,  $MN$  is parallel to  $QR$  and  $PMMQ = 23$  [3]

- (i) Find  $MN / QR$   
(ii) Prove that  $\triangle OMN$  and  $\triangle ORQ$  are similar.  
(iii) Find, Area of  $\triangle OMN$ : Area of  $\triangle ORQ$   
[2018]

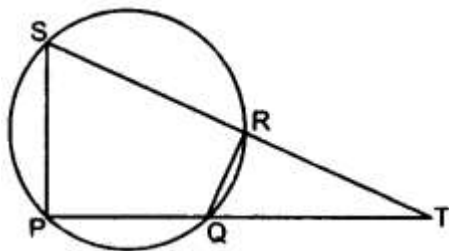


8.  $PQR$  is a triangle.  $S$  is a point on the side  $QR$  of  $\triangle PQR$  such that  $\angle PSR = \angle QPR$ . Given  $QP = 8$  cm,  $PR = 6$  cm and  $SR = 3$  cm. [3]



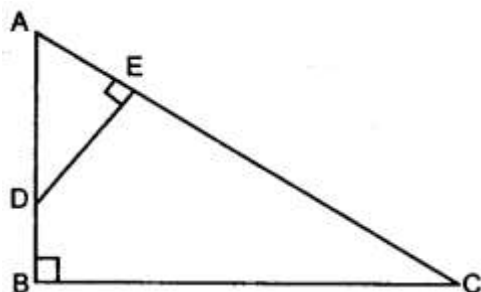
- (i) Prove  $\triangle PQR \sim \triangle SPR$   
(ii) Find the length of  $QR$  and  $PS$   
(iii) area of  $\triangle PQR$  / area of  $\triangle SPR$  [2017]

9. In the given figure PQRS is a cyclic quadrilateral PQ and SR produced meet at T. [4]



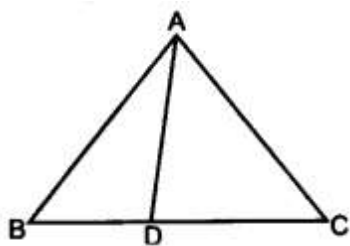
- (i) Prove  $\Delta TPS \sim \Delta TRQ$ .
- (ii) Find SP if  $TP = 18\text{cm}$ ,  $RQ = 4\text{cm}$  and  $TR = 6\text{cm}$ .
- (iii) Find area of quadrilateral PQRS if area of  $\Delta PTS = 27\text{ cm}^2$  [2016]

10. ABC is a right angled triangle with  $\angle ABC = 90^\circ$ . D is any point on AB and DE is perpendicular to AC.



Prove that:

- (i)  $\Delta ADE \sim \Delta ACB$ .
  - (ii) If  $AC = 13\text{ cm}$ ,  $BC = 5\text{ cm}$  and  $AE = 4\text{ cm}$ . Find DE and AD.
  - (iii) Find, area of  $\Delta ADE$ : area of quadrilateral BCED. [2015]
11. In  $\Delta ABC$ ,  $\angle ABC = \angle DAC$ ,  $AB = 8\text{ cm}$ ,  $AC = 4\text{ cm}$ ,  $AD = 5\text{ cm}$ .

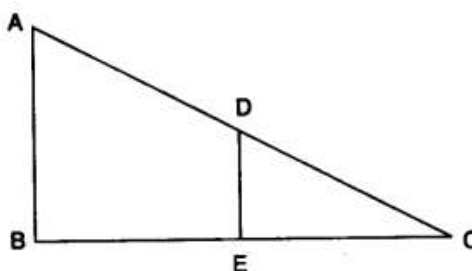


- (i) Prove that  $\Delta ACD$  is similar to  $\Delta BCA$ .
- (ii) Find BC and CD
- (iii) Find area of  $\Delta ACD$  : area of  $\Delta ABC$ . [2014]

12. [2013]

In the given figure,  $AB$  and  $DE$  are perpendicular to  $BC$ .

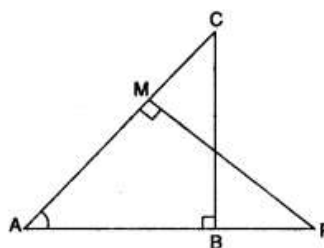
- (i) Prove that  $\triangle ABC \sim \triangle DEC$
- (ii) If  $AB = 6$  cm,  $DE = 4$  cm and  $AC = 15$  cm. Calculate  $CD$ .
- (iii) Find the ratio of the area of  $\triangle ABC$  : area of  $\triangle DEC$ . [3]



13. In the given figure  $\triangle ABC$  and  $\triangle AMP$  are right angled at  $B$  and  $M$  respectively.

Given,  $AB = 10$  cm,  $AP = 15$  cm  
and  $PM = 12$  cm

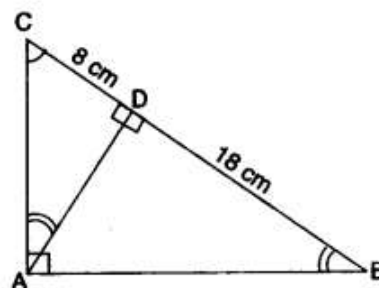
- (i) Prove that  $\triangle ABC \sim \triangle AMP$
- (ii) Find  $AB$  and  $BC$ . [3]



[2012]

14. In the adjoining figure  $ABC$  is a right-angled triangle with  $\angle BAC = 90^\circ$ ,

- (i) Prove  $\triangle ADB \sim \triangle CDA$
- (ii) If  $BD = 18$  cm and  $CD = 8$  cm, find  $AD$ .
- (iii) Find the ratio of area of  $\triangle ADB$  is to area of  $\triangle CDA$ .



[2011]

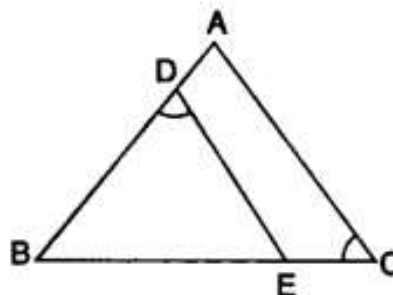
15. In the figure  $ABC$  is a triangle with  $\angle EDB = \angle ACB$ .

Prove that  $\triangle ABC \sim \triangle EBD$

If  $BE = 6$  cm,  $EC = 4$  cm  $BD = 5$  cm and  
area of  $\triangle BED = 9$  cm<sup>2</sup>

Calculate the (i) length of  $AB$

(ii) area of  $\triangle ABC$  [2010]



## ANSWERS

1. (b) 15 cm (c) 5 : 8
2. (c) 3 : 2
3. (b)
4. (i) (b) (ii) (a) (iii) (b) (iv) (c)
5. (b)
6. (ii) 25 : 21
7. (i)  $\frac{2}{5}$  (iii) 4 : 25
8. (ii) OR = 10cm PS = 4cm (iii) 4 : 1
9. (ii) 12 cm (iii) 24 cm<sup>2</sup>
10. (ii) DE =  $1\frac{2}{3}$  cm, AD =  $4\frac{1}{3}$  cm (iii) 1 : 8
11. (ii) BC = 6.4 cm, CD = 2.5 cm (iii) 25 : 64
12. CD = 10cm (iii) 9 : 4
13. (ii) AC =  $16\frac{2}{3}$  cm BC =  $13\frac{1}{3}$  cm
14. (ii) AD = 12 cm (iii) 9 : 4
15. (i) 12 cm (ii) 36 cm<sup>2</sup>