chapter - 6

Triangles

Previous Years Questions

6.2 Similar Figures

VSA (1 mark)

1. All concentric circles are _____to each other.
   (2020)
2. Two polygons having same number of sides and corresponding sides proportional are similar or not?
   (Board Term I, 2016)

6.3 Similarity of Triangles

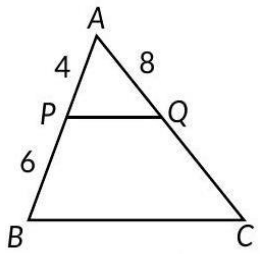
MCQ

3. In $\triangle ABC, PQ \parallel BC$. If $PB = 6$ cm, $AP = 4$ cm, $AQ = 8$ cm, find the length of AC.
   (a) 12 cm

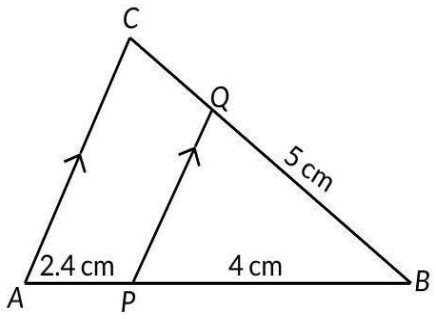
   (b) 20 cm

   (c) 6 cm

   (d) 14 cm



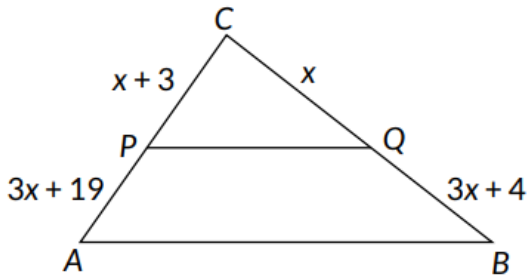
   (2023)
4. In the given figure, $PQ \parallel AC$. If $BP = 4$ cm, $AP = 2.4$ cm and $BQ = 5$ cm, then length of BC is



(a) 8 cm
(b) 3 cm
(c) 0.3 cm
(d) $\frac{25}{3}$ cm

(2023)

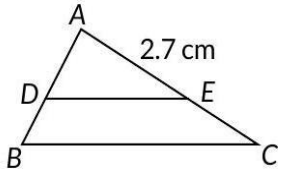
5. In the figure given below, what value of x will make $PQ \parallel AB$?



(a) 2
(b) 3
(c) 4
(d) 5

(Term I, 2021-22)

6. In figure, $DE \parallel BC$. If $\frac{AD}{DB} = \frac{3}{2}$ and $AE = 2.7$ cm, then EC is equal to



(a) 2.0 cm

(b) 1.8 cm

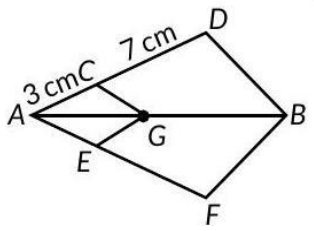
(c) 4.0 cm

(d) 2.7 cm

(2020)

VSA (1 mark)

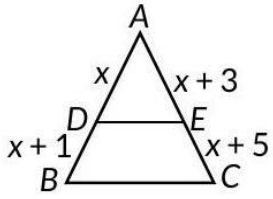
7. In figure, $GC \parallel BD$ and $GE||BF$. If $AC = 3$ cm and $CD = 7$ cm, then find the value of $\frac{AE}{AF}$. (2019C) *Ap*



8. In $\triangle ABC, X$ is middle point of AC. If $XY \parallel AB$, then prove that Y is middle point of BC. (Board Term I, 2017)

9. In $\triangle ABC, D$ and E are point on side AB and AC respectively, such that $DE \parallel BC$. If $AE = 2$ cm, $AD = 3$ cm and $BD = 4.5$ cm, then find CE. (Board Term I, 2017)

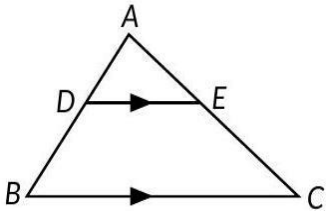
10. In $\triangle ABC, DE \parallel BC$, then find the value of x.



(Board Term I, 2017)

11. In given figure, $DE \parallel BC$

If $\frac{AD}{DB} = \frac{3}{4}$ and $AC = 14$ cm, find EC.

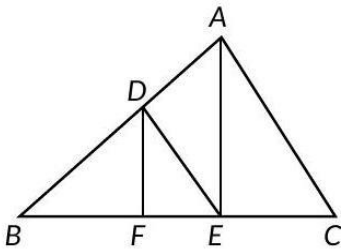


(Board Term I, 2017)

SA I (2 marks)

12. In the given figure, $DE \parallel AC$ and $DF \parallel AE$.

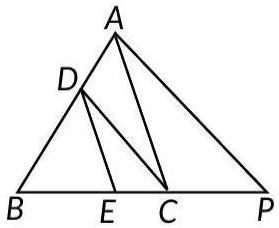
    Prove that $\frac{BF}{FE} = \frac{BE}{EC}$.



(NCERT, 2020)

OR

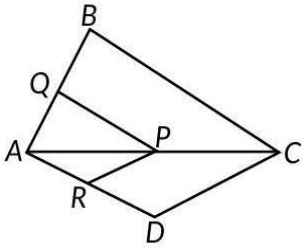
In figure, $DE \parallel AC$ and $DC \parallel AP$. Prove that $\frac{BE}{EC} = \frac{BC}{CP}$.



(2020)

13. In figure, if $PQ \parallel BC$ and $PR \parallel CD$, prove that

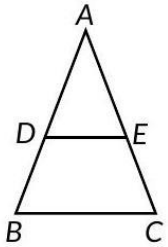
$$\frac{QB}{AQ} = \frac{DR}{AR}$$



(2020)

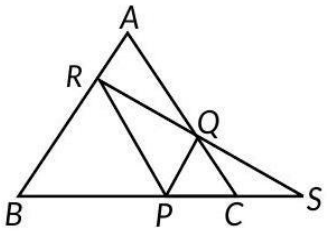
SA II (3 marks)

14. In figure $\angle D = \angle E$ and $\frac{AD}{DB} = \frac{AE}{EC}$, prove that $\triangle ABC$ is an isosceles triangle.



(2020)

15. In the figure, P is any point on side BC of $\triangle ABC$. $PQ \parallel BA$ and $PR \parallel CA$ are drawn. RQ is extended to meet BC produced at S. Prove that $SP^2 = SB \times SC$.



(Board Term I, 2017)

LA (4/5 / 6 marks)

16. If a line is drawn parallel to one side of a triangle to intersect the other two sides at distinct points, prove that the other two sides are divided in the same ratio.

(2020,2015)

OR

State and prove Basic Proportionality Theorem (Thales Theorem).

(Board Term I, 2015)

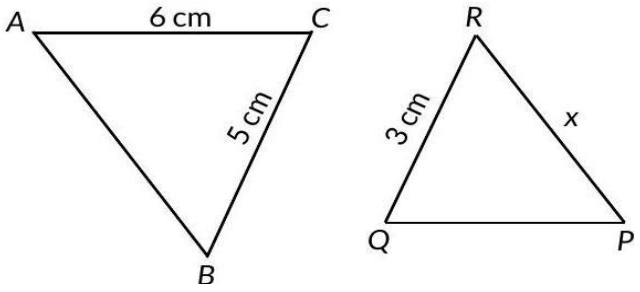
17. $ABCD$ is a trapezium with $AB \parallel CD$. E and F are points on non parallel sides AD and BC respectively, such that $EF \parallel AB$. Show that $\frac{AE}{ED} = \frac{BF}{FC}$

(2019C)

6.4 Criteria for Similarity of Triangles

MCQ

18. In the given figure, $\triangle ABC \sim \triangle QPR$. If $AC = 6$ cm, $BC = 5$ cm, $QR = 3$ cm and $PR = x$, then the value of x is



(a) 3.6 cm
(b) 2.5 cm
(c) 10 cm
(d) 3.2 cm

(2023)

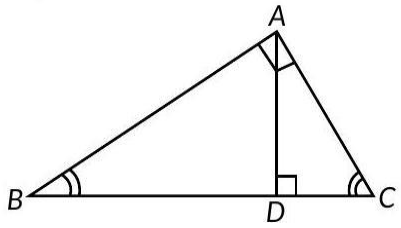
19. If $\triangle ABC$ and $\triangle PQR$ are similar triangles such that $\angle A = 31^\circ$ and $\angle R = 69^\circ$, then $\angle Q$ is
(a) 70°
(b) 100°
(c) 90°
(d) 80°

(Term I, 2021-22)

20. A vertical pole of length 19 m casts a shadow 57 m long on the ground and at the same time a tower casts a shadow 51 m long. The height of the tower is
(a) 171 m
(b) 13 m
(c) 17 m
(d) 117 m

(Term I, 2021-22) U

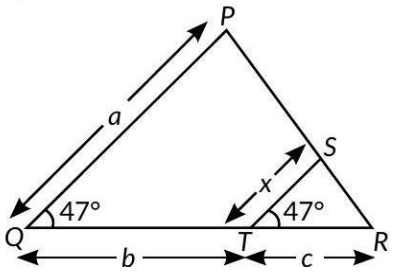
21. In the given figure, $\angle ABC$ and $\angle ACB$ are complementary to each other and $AD \perp BC$. Then,



(a) $BD \cdot CD = BC^2$
(b) $AB \cdot BC = BC^2$
(c) $BD \cdot CD = AD^2$
(d) $AB \cdot AC = AD^2$

(Term I, 2021-22)

22. In the given figure, x expressed in terms of a, b, c, is

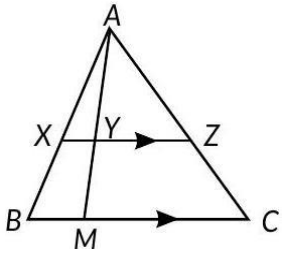


(a) $x = \frac{ab}{a+b}$
(b) $x = \frac{ac}{b+c}$
(c) $x = \frac{bc}{b+c}$
(d) $x = \frac{ac}{a+c}$

(Term I, 2021-22)

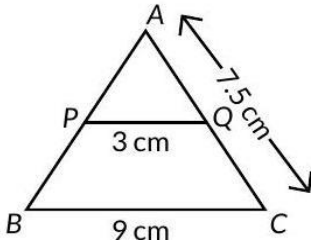
SA I (2 marks)

23. In the given figure, XZ is parallel to BC. $AZ = 3$ cm, $ZC = 2$ cm, $BM = 3$ cm and $MC = 5$ cm. Find the length of XY.

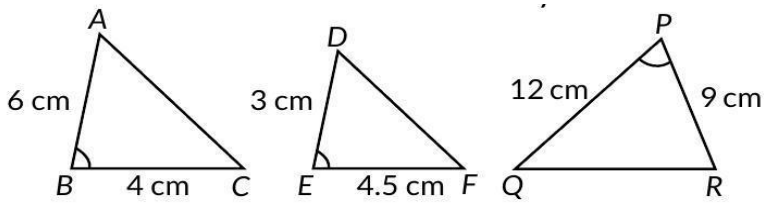


(2023)

24. In figure, $PQ \parallel BC, PQ = 3$ cm, $BC = 9$ cm and $AC = 7.5$ cm. Find the length of AQ.



25. State which of the two triangles given in the figure are similar. Also state the similarity criterion used.

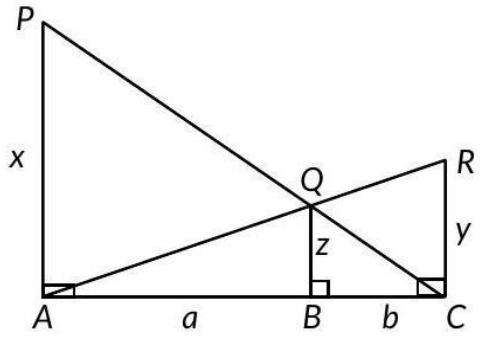


(Board Term I, 2016)

26. Sides AB, BC and median AD of a $\triangle ABC$ are respectively proportional to sides PQ, QR and median PM of $\triangle PQR$. Show that $\triangle ABC \sim \triangle PQR$. (Board Term I, 2015)

SA II (3 marks)

27. PA, QB and RC are each perpendicular to AC. If $AP = x, QB = z, RC = y, AB = a$ and $BC = b$, then prove that $\frac{1}{x} + \frac{1}{y} = \frac{1}{z}$.

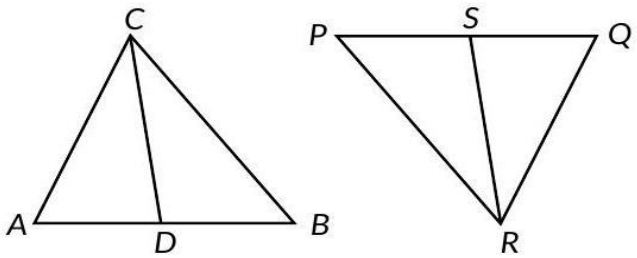


(2023)

28. In the given figure, CD and RS are respectively the medians of $\triangle ABC$ and $\triangle PQR$. If $\triangle ABC \sim \triangle PQR$ then prove that:

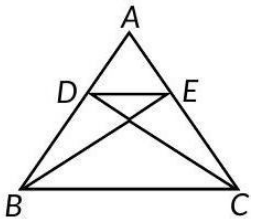
(i) $\triangle ADC \sim \triangle PSR$

(ii) $AD \times PR = AC \times PS$



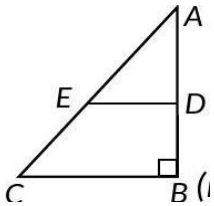
(2023)

29. In the figure, if $\triangle BEA \cong \triangle CDA$, then prove that $\triangle DEA \sim \triangle BCA$.



(Board Term I, 2017)

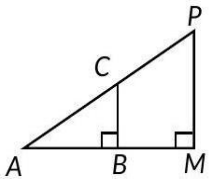
30. In $\triangle ABC, \angle ADE = \angle B$ then prove that $\triangle ADE \sim \triangle ABC$ also if $AD = 7.6$ cm, $BD = 4.2$ cm and $BC = 8.4$ cm, then find DE



31. A girl of height 100 cm is walking away from the base of a lamp post at a speed of 1.9 m/s. If the lamp is 5 m above the ground, find the length of her shadow after 4 seconds.

(Board Term I, 2016)

32. $\triangle ABC$ and $\triangle AMP$ are two right angled triangles right angled at B and M respectively. Prove that $CA \times MP = PA \times BC$.



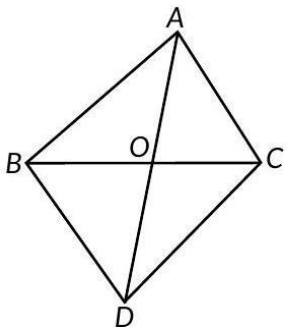
(Board Term I, 2016)

LA (4 / 5 / 6 marks)

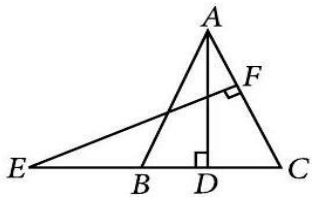
33. (A) In a $\triangle PQR, N$ is a point on PR, such that $QN \perp PR$. If $PN \times NR = QN^2$, prove that $\angle PQR = 90°$.

(2023)

34. In the given figure, $\triangle ABC$ and $\triangle DBC$ are on the same base BC. If AD intersects BC at O, prove that $\frac{\text{ar}(\triangle ABC)}{\text{ar}(\triangle DBC)} = \frac{AO}{DO}$.

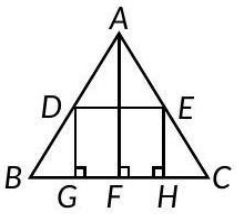


35. In the given figure, E is a point on CB produced of an isosceles $\triangle ABC$, with side $AB = AC$. If $AD \perp BC$ and $EF \perp AC$, prove that $\triangle ABD \sim \triangle ECF$.



(NCERT, AI 2019)

36. In the given figure, ABC is a triangle and GHED is a rectangle. $BC = 12$ cm, $HE = 6$ cm, $FC = BF$ and altitude $AF = 24$ cm. Find the area of the rectangle.



(Board Term I, 2017)

37. Two poles of height ' p ' and ' q ' metres are standing vertically on a level ground, ' a ' metres apart. Prove that the height of the point of intersection of the lines joining the top of each pole to the foot of the opposite pole is given by $\frac{pq}{p+q}$.

(Board Term I, 2017)

38. In $\triangle ABC$, from A and B altitudes AD and BE are drawn. Prove that $\triangle ADC \sim \triangle BEC$. Is $\triangle ADB \sim \triangle AEB$ and $\triangle ADB \sim \triangle ADC$?

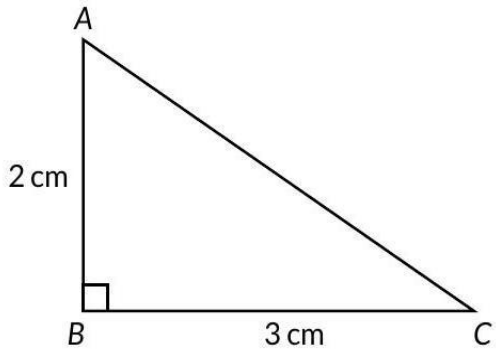
(Board Term I, 2016)

Pythagoras Theorem

MCQ

39. Assertion (A) : The perimeter of $\triangle ABC$ is a rational number.

Reason (R) : The sum of the squares of two rational numbers is always rational.



(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).

(c) Assertion (A) is true, but Reason (R) is false.

(d) Assertion (A) is false but Reason (R) is true.

(2023)

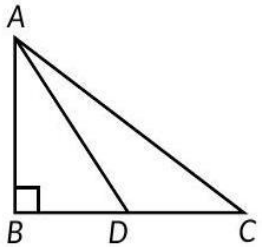
VSA (1 marks)

40. Aman goes 5 metres due west and then 12 metres due North. How far is he from the starting point?

(2021 C)

SA II (3 marks)

41. In $\triangle ABC, \angle B = 90°$ and D is the mid point of BC. Prove that $AC^2 = AD^2 + 3CD^2$



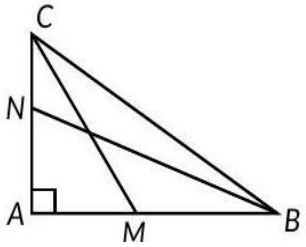
(2019)

42. Prove that the sum of squares of the sides of a rhombus is equal to the sum of squares of its diagonals.

(2019)

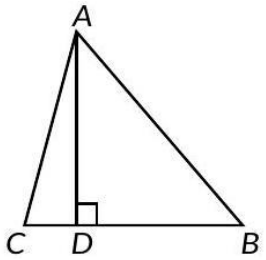
LA (4/5 / 6 marks)

43. In given figure BN and CM are medians of a right angled at A. Prove that $4(BN^2 + CM^2) = 5BC^2$



(2020C)

44. The perpendicular from A on the side BC of a $\triangle ABC$ intersects BC at D, such that $DB = 3CD$. Prove that $2AB^2 = 2AC^2 + BC^2$



(2019C)