

Triangles

<1M>

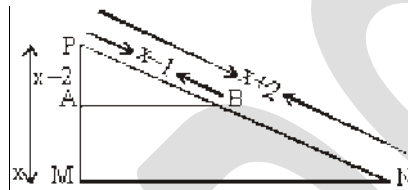
1. In $\triangle ABC$ right angled at C, AD is median. Then $AB^2 =$

- (A) $AC^2 - AD^2$
- (B) $AD^2 - AC^2$
- (C) $3AC^2 - 4AD^2$
- (D) $4AD^2 - 3AC^2$

2. Which of the following statement is true?

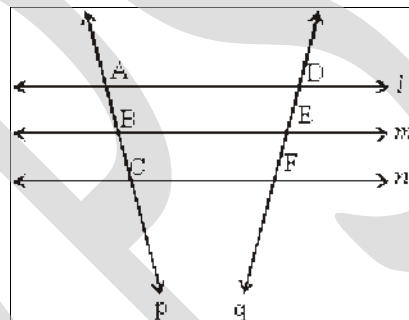
- (A) Any two right triangles are similar
- (B) Any two squares are similar
- (C) Any two rectangles are similar
- (D) Both b and c

3. In the given fig. $AB \parallel MN$, If $PA = x - 2$, $PM = x$; $PB = x - 1$ and $PN = x + 2$, find the value of 'x'.



- (A) 2
- (B) 3
- (C) 4
- (D) none

4. If three or more parallel lines are intersected by transversals, the intercepts made by them on the transversals are



- (A) $\frac{AD}{BE} = \frac{BE}{CF}$
- (B) $\frac{AE}{BD} = \frac{BF}{CE}$
- (C) $\frac{AC}{BC} = \frac{DF}{DE}$
- (D) $\frac{AB}{BC} = \frac{DE}{EF}$

5. If ABC is an equilateral triangle with side 12 cm, then the area of triangle formed by joined its mid points is :

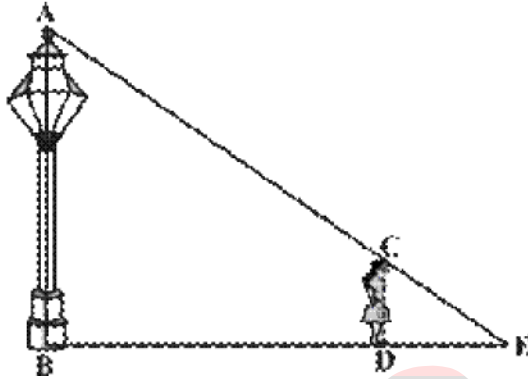
- (A) $9\sqrt{3}$ sq cm
- (B) $2\sqrt{2}$ sq cm
- (C) 64 sq cm
- (D) none of these

6. The areas of two similar triangles are 121 cm² and 64 cm² respectively. If the median of the first triangle is 12.1 cm. find the corresponding median of the other.

- (A) 8 cm

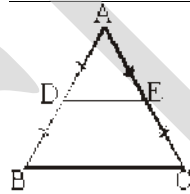
- (B) 8.5 cm
- (C) 8.9 cm
- (D) 8.8 cm

7. A girl of height 120 cm is walking from the base of a lamp-post at a speed of 1.2 m/s. If the lamp is 3.6 m above the ground, find the length of her shadow after 4 seconds.



- (A) 1.6 m
- (B) 2.2 m
- (C) 2.4 m
- (D) 2.6 m

8. The line segment joining the midpoints of any two sides of a triangle is parallel to

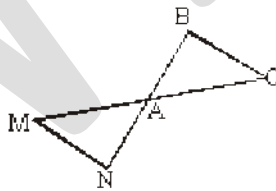


- (A) right angle
- (B) isosceles triangle
- (C) second side
- (D) Third side

9. If D, E, F are the midpoints of sides BC, CA, AB of $\triangle ABC$. Then the $\triangle DEF$ and $\triangle ABC$ are _____

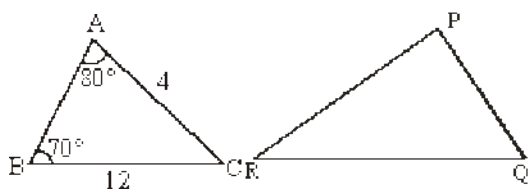
- (A) congruent
- (B) similar
- (C) both A & B
- (D) none of these

10. Given $MN \parallel BC$, $\triangle ABC$ and $\triangle ANM$ are _____.



- (A) similar
- (B) congruent
- (C) neither similar nor congruent
- (D) none of these

11. If $\triangle ABC \cong \triangle PQR$ and then find $\angle R$.



- (A) 20°
- (B) 30°

- (C) 35°
(D) 37°

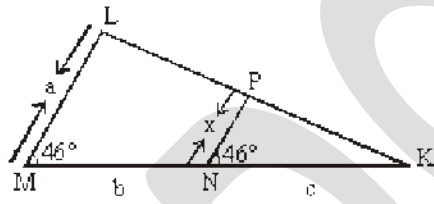
12. In $\triangle ABC$, $AB > AC$ and $AD \perp BC$. Then $AB^2 - AC^2$

- (A) $BD^2 + AD^2$
(B) $BD^2 + CD^2$
(C) $BD^2 + AC^2$
(D) $BD^2 - CD^2$

13. If the corresponding sides of two triangles are proportional then they are

- (A) congruent
(B) similar
(C) proportional
(D) none of these

14. From given fig. express 'x' in terms of a, b, c.



- (A) $\frac{-ac}{b+c}$
(B) $\frac{ac}{b-c}$
(C) $\frac{ac}{b+c}$
(D) None

15. The areas of two similar triangles are 64 cm^2 , 49 cm^2 . Altitude of first one is 6 cm. Then altitude of second in cm is.

- (A) 5.25cm
(B) 3.5
(C) 27.56

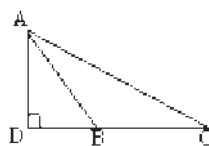
16. $\triangle ABC$ and $\triangle DEF$ are similar, in which $BC = 3.5 \text{ cm}$, $EF = 2.5 \text{ cm}$ and area of $\triangle ABC = 7 \text{ sq cm}$. Then area of $\triangle DEF$ in sq cm is

- (A) 4.59
(B) 5.49
(C) 9.54
(D) 3.57

17. If the ratios of areas of two similar triangles are $81 : 49$ the ratios of their corresponding angle-bisector segments is:

- (A) 5 : 4
(B) 9 : 7
(C) 4 : 5
(D) 625 : 256

18. In the figure $\angle ABC$ is obtuse. Then $AC^2 =$



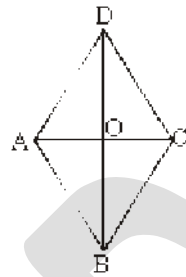
- (A) $AB^2 + BC^2 - 2BC \cdot BD$
(B) $AB^2 + BC^2$

- (C) $AB^2 + BC^2 + 2BC \cdot BD$
 (D) $AD^2 + BD^2$

19. In the figure, $CD \perp AB$, $CD = p$. Then $\frac{c}{a} =$

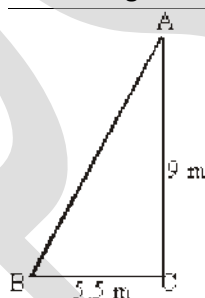
- (A) $\frac{c}{b}$
 (B) $-p/b$
 (C) $\frac{b}{p}$
 (D) None of these

20. In rhombus ABCD, $AB^2 + BC^2 + CD^2 + DA^2 =$



- (A) $OA^2 + OB^2$
 (B) $OB^2 + OC^2$
 (C) $OC^2 + OD^2$
 (D) $AC^2 + BD^2$

21. A ladder is placed against a wall such that its foot is at a distance of 5.5m from the wall and its top reaches a window 9 m above the ground. Find the length of the ladder.



- (A) 10.52 m
 (B) 10.54 m
 (C) 11 m
 (D) 10.9 m

22. In a right angle triangle, one of the angles is 60 degree, the side opposite to this angle is .

- (A) $\frac{1}{2} \times \text{hypotenuse}$
 (B) $\frac{1}{\sqrt{2}} \times \text{hypotenuse}$
 (C) $\frac{2}{3} \times \text{hypotenuse}$
 (D) $\frac{\sqrt{3}}{2} \times \text{hypotenuse}$

23. In equilateral triangle ABC, if $AD \perp BC$, then:

- (A) $2AB^2 = 3AD^2$
 (B) $4AB^2 = 3AD^2$

- (C) $3AB^2 = 4AD^2$
 (D) $3AB^2 = 2AD^2$

24. On joining the mid points of the sides of a triangle along with any of the vertices as the fourth point make a .

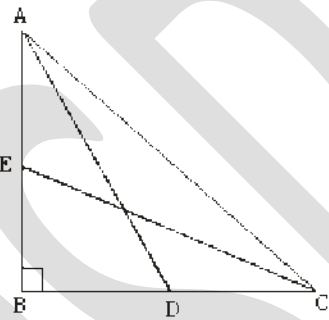
- (A) parallelogram
 (B) Rhombus
 (C) rectangle
 (D) Square.

25. The triangle with measurements $a = (2p - 1)$, $b = 2\sqrt{2p}$, $c = (2p + 1)$ is

- (A) equilateral
 (B) right angled
 (C) isosceles
 (D) none of these

26. In the fig. ABC is a rt. $\triangle$, rt. angled at B. AD and CE are the two medians drawn from A and C

respectively. If $AC = 5$ cm. and $AD = \frac{3\sqrt{5}}{2}$ cm. Then CE



- (A) $\frac{\sqrt{5}}{2}$ cm
 (B) $\frac{\sqrt{7}}{2}$ cm
 (C) $2\sqrt{5}$ cm
 (D) none of these

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27. The perimeters of two similar triangles are 36 cm and 48 cm respectively. If one side of the first triangle is 9 cm, what is the corresponding side of the other triangle?

28. ABC is a right triangle right-angled at B. Let D and E be any points on AB and BC respectively. Prove that $AE^2 + CD^2 = AC^2 + DE^2$

29. Any point X inside the $\triangle DEF$ is joined to its vertices. From a point P in DX, PQ is drawn parallel to DE meeting XE at Q and QR is drawn parallel to EF meeting XF in R. Prove that $PR \parallel DF$

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30. A girl of height 90 cm is walking away from the base of a lamp-post at a speed of 1.2 m/s. If the lamp is 3.6 m above the ground, find the length of her shadow after 4 seconds.

31. A Point O in the interior of a rectangle ABCD is joined with each of the vertices A, B, C and D prove that $OB^2 + OD^2 = OC^2 + OA^2$

32.

In a trapezium $ABCD$, $AB \parallel DC$ and $DC = 2AB$; FE drawn parallel to AB cuts AD in F and BC in E , such that $\frac{BE}{EC} = \frac{3}{4}$ Diagonal DB intersects

FE at G . Prove that $7FE = 10AB$

33. ABC is a triangle in which $AB=AC$ and D is any point in BC. Prove that $AB^2 - AD^2 = BD \cdot CD$

34. D, E and F are respectively mid-points of the sides of BC, CA and AB of $\triangle ABC$. Find the ratio of the areas of $\triangle DEF$ and $\triangle ABC$

35. In figure $\triangle ABC$ is a right triangle, right angled at B. Medians $\overline{AD}$ and $\overline{CE}$ are of respective lengths 5 cm and $2\sqrt{5}$ cm. Find the length of $\overline{AC}$.

36.

ABC is a right triangle right-angled at C. Let $\overline{BC} = a, \overline{CA} = b, \overline{AB} = c$ and let p be the length of perpendicular from C on AB prove that

(i) $cp = ab$

(ii) $\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}$

37. In Figure if $\overline{AD} \perp \overline{BC}$ prove that $AB^2 + CD^2 = BD^2 + AC^2$

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38. Prove that the ratio of the areas of two similar triangles is equal to the ratio of squares of their corresponding sides.

39. Prove that in a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides

Use the above theorem in the figure to prove that

$$PR^2 = PQ^2 + QR^2 - 2QM \cdot QR$$

40. If a line is drawn parallel to one side of a triangle intersecting the other two sides, then the other sides are divided in the same ratio. Prove this theorem Using above theorem, prove that in the figure if $ABCD$ is a trapezium in which

