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TRIANGLES

Class 10 - Mathematics

Time Allowed: 1 hour and 30 minutes **Maximum Marks: 45**

1. A street light is fixed on a pole 6 m above the ground. If a woman of height 1.5 m casts a shadow of 3, then distance between her and the base of the pole is _____ **[1]**

   a) 12 m
   b) 9 m
   c) 8 m
   d) 10 m

2. In △ABC and △DEF, it is given that $\frac{AB}{DE} = \frac{BC}{FD}$ then **[1]**

   a) ∠A = ∠D
   b) ∠B = ∠D
   c) ∠B = ∠E
   d) ∠A = ∠F

3. In △ABC, D and E are points on side AB and AC respectively such that DE || BC and AD : DB = 3 : 1. If EA = 3.3 cm, then AC = **[1]**

   a) 1.1 cm
   b) 5.5 cm
   c) 4 cm
   d) 4.4 cm

4. Which of the following is a true statement? **[1]**

   a) Two triangles are similar if their corresponding sides are proportional.
   b) Two polygons are similar if their corresponding sides are proportional.
   c) Two similar triangles are always congruent.
   d) Two figures are similar if they have the same shape and size.

5. In a △ ABC, $\angle A = 90^\circ$, AB = 5 cm and AC = 12 cm. Also $AD \perp BC$, Then AD = **[1]**

   a) $\frac{2\sqrt{15}}{13}$cm
   b) $\frac{60}{13}$cm
   c) $\frac{13}{40}$cm
   d) $\frac{13}{2}$cm

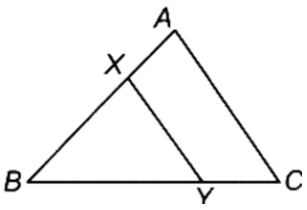
6. It is given that $\triangle ABC \sim \triangle DFE$. If ∠A = 30°, ∠C = 50°, AB = 5 cm, AC = 8 cm and DF = 7.5 cm then which of the following is true? **[1]**

   a) DE = 12 cm, ∠F = 50°
   b) EF = 12 cm, ∠F= 10°
   c) EF = 12 cm, ∠D = 100°
   d) DE = 12 cm, ∠F = 100°

7. In ΔABC and ΔPQR, ∠B = ∠Q, ∠R = ∠C and AB = 2PQ. Then, the triangles are **[1]**

   a) Congruent but not similar.
   b) Similar but not congruent.
   c) Neither congruent nor similar.
   d) Congruent as well as similar.

8. In the given figure, the line segment XY is parallel to side AC of △ABC and it divides the triangle into two parts of equal area. Then, find **[1]**



i. AX : AB

ii. $\frac{AC}{XY}$

a) (i) $(2+\sqrt{2}):3$, (ii) $\sqrt{2}-3$

b) (i) $(2+\sqrt{2}):2$, (ii) $\sqrt{2}-2$

c) (i) $(2-\sqrt{3}):3$, (ii) 3

d) (i) $(2-\sqrt{2}):2$, (ii) $\sqrt{2}-1$

9. If $\triangle ABC \sim \triangle DEF$, $\frac{\text{ar}(\triangle ABC)}{\text{ar}(\triangle DEF)} = \frac{9}{25}$, BC = 21 cm, then EF is equal to **[1]**

a) 35 cm

b) 6 cm

c) 25 cm

d) 9 cm

10. $\triangle$ABC is a right triangle right-angled at A and $AD \perp BC$, Then $\frac{BD}{DC} =$ **[1]**

a) $\frac{AB}{AD}$

b) $\frac{AB}{AC}$

c) $\left(\frac{AB}{AD}\right)^2$

d) $\left(\frac{AB}{AC}\right)^2$

11. P and Q are points on the sides AB and AC respectively of a $\triangle ABC$. If AP = 2 cm, PB = 4 cm, AQ = 3 cm and QC = 6 cm, show that BC = 3PQ. **[3]**

12. If three or more parallel lines are intersected by two transversals, prove that the intercepts made by them on the transversals are proportional. **[3]**

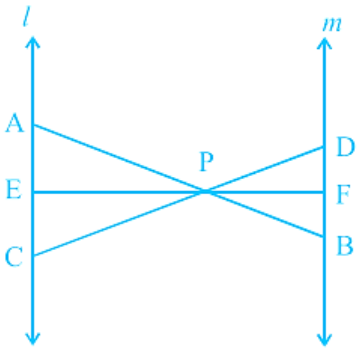
13. In ΔABC, the bisector of $\angle$B meets AC at D. A line $PQ \| AC$ meets AB, BC and BD at P, Q and R respectively. Show that **[3]**

i. PR.BQ = QR. BP

ii. AB $\times$ CQ = BC $\times$ AP

14. In $\triangle$ABC, $\angle$B = 90° and AD $\perp$ AC. If DC = 7 cm and AD = 3 cm, then find the length of BD. **[3]**

15. In the figure, l || m and line segments AB, CD, and EF are concurrent at point P. Prove that $\frac{AE}{BF} = \frac{AC}{BD} = \frac{CE}{FD}$. **[3]**



16. In the given figure, DEFG is a square and $\angle BAC = 90^\circ$. **[5]**

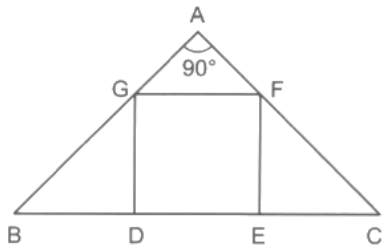
Prove that

i. $\triangle AGF \sim \triangle DBG$

ii. $\triangle AGF \sim \triangle EFC$

iii. $\triangle DBG \sim \triangle EFC$

iv. $DE^2 = BD \times EC$



17. Prove that in a right angled triangle the square on the hypotenuse is equal to sum of the squares on other two sides. **[5]**

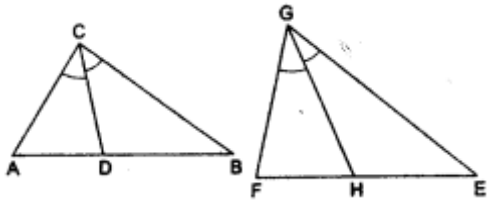
Using the above, prove that the sum of squares on the sides of a rhombus is equal to sum of squares on its diagonals.

18. In the given figure, CD and GH are respectively the bisectors of C and G respectively. If, $\Delta ABC \sim \Delta FEG$, prove that: **[5]**

a. $\triangle ADC \sim \triangle FHG$

b. $\triangle BCD \sim \triangle EGH$

c. $\frac{CD}{GH} = \frac{AC}{FG}$



19. D and E are the points on the sides AB and AC respectively of a ΔABC such that: AD = 8 cm, DB = 12 cm, AE = 6 cm and CE = 9 cm. Prove that BC = 5/2 DE. **[5]**

Scan for Key