



## VIDYA BHARATI SCHOOL

OLYMPIAD WORKSHEET: August - 2017

GRADE: X

SUBJECT: MATHEMATICS

---

- Q1. The areas of two similar triangles are in respectively  $9 \text{ cm}^2$  and  $16 \text{ cm}^2$ . The ratio of their corresponding sides is
- (a) 3 : 4                      (b) 4 : 3                      (c) 2 : 3                      (d) 4 : 5
- Q2.  $\triangle ABC$  and  $\triangle BDE$  are two equilateral triangles such that D is the mid-point of BC. The ratio of the areas of triangles ABC and BDE is
- (a) 2 : 1                      (b) 1 : 2                      (c) 4 : 1                      (d) 1 : 4
- Q3. If  $\triangle ABC$  and  $\triangle DEF$  are similar such that  $2 AB = DE$  and  $BC = 8 \text{ cm}$ , then  $EF =$
- (a) 16 cm                      (b) 12 cm                      (c) 8 cm                      (d) 4 cm
- Q4. XY is drawn parallel to the base BC of a  $\triangle ABC$  cutting AB at X and AC at Y. If  $AB = 4 BX$  and  $YC = 2 \text{ cm}$ , then  $AY =$
- (a) 2 cm                      (b) 4 cm                      (c) 6 cm                      (d) 8 cm
- Q5. In triangles ABC and DEF,  $\angle A = \angle E = 40^\circ$ ,  $AB : ED = AC : EF$  and  $\angle F = 65^\circ$ , then  $\angle B =$
- (a)  $35^\circ$                       (b)  $65^\circ$                       (c)  $75^\circ$                       (d)  $85^\circ$
- Q6. If D, E, F are the mid-points of sides BC, CA and AB respectively of  $\triangle ABC$ , then the ratio of the areas of triangles DEF and ABC is
- (a) 1 : 4                      (b) 1 : 2                      (c) 2 : 3                      (d) 4 : 5
- Q7. In an equilateral triangle ABC, if  $AD \perp BC$ , then
- (a)  $2AB^2 = 3AD^2$                       (b)  $4AB^2 = 3AD^2$   
(c)  $3AB^2 = 4AD^2$                       (d)  $3AB^2 = 2AD^2$

- Q8. In a  $\Delta ABC$ , AD is the bisector of  $\Delta BAC$ . If  $AB = 6$  cm,  $AC = 5$  cm and  $BD = 3$  cm, then  $DC =$
- (a) 11.3 cm      (b) 2.5 cm      (c) 3 : 5 cm      (d) None of these
- Q9. ABCD is a trapezium such that  $BC \parallel AD$  and  $AB = 4$  cm. If the diagonals AC and BD intersect at O such that  $\frac{AO}{OC} = \frac{DO}{OB} = \frac{1}{2}$  then  $BC =$
- (a) 7 cm      (b) 8 cm      (c) 9 cm      (d) 6 cm
- Q10. If ABC is a right triangle right-angled at B and M, N are the mid-points of AB and BC respectively, then  $4(AN^2 + CM^2) =$
- (a)  $4AC^2$       (b)  $5AC^2$       (c)  $\frac{5}{4}AC^2$       (d)  $6AC^2$
- Q11. These areas of two similar triangles are  $121 \text{ cm}^2$  and  $64 \text{ cm}^2$  respectively. If the median of the first triangles is 12.1 cm, then the corresponding median of the other triangle is
- (a) 11 cm      (b) 8.8 cm      (c) 11.1 cm      (d) 8.1 cm
- Q12. In an isosceles triangle ABC if  $AC = BC$  and  $AB^2 = 2AC^2$ , then  $\angle C =$
- (a)  $30^\circ$       (b)  $2CD^2$       (c)  $90^\circ$       (d)  $60^\circ$
- Q13. A chord of a circle of radius 10 cm subtends a right angle at the centre. The length of the chord (in cm) is
- (a)  $5\sqrt{2}$       (b)  $10\sqrt{2}$       (c)  $\frac{5}{\sqrt{2}}$       (d)  $10\sqrt{3}$
- Q14. A vertical stick 20 m long casts a shadow 10 m long on the ground. At the same time, a tower casts a shadow 50 m long on the ground. The height of the tower is
- (a) 100 m      (b) 120 m      (c) 25 m      (d) 200 m
- Q15. A  $\Delta ABC$ , a line XY parallel to BC cuts AB at X and AC at Y. If BY bisects  $\angle XYC$ , then
- (a)  $BC = CY$       (b)  $BC = BY$       (c)  $BC \neq CY$       (d)  $BC \neq BY$

Q16. In a  $\triangle ABC$ , point D is on side BC and point E is on side AC, such that BCED is a trapezium. If  $DE : BC = 3 : 5$ , then  $\text{Area} (\triangle ADE) : \text{Area} (\square BCED) =$

- (a) 3 : 4                      (b) 9 : 16                      (c) 3 : 5                      (d) 9 : 25

Q17.  $\triangle ABC$  is a right triangle right-angled at A and  $AD \perp BC$ . Then,  $\frac{BD}{DC} =$

- (a)  $\left(\frac{AB}{AC}\right)^2$                       (b)  $\frac{AB}{AC}$                       (c)  $\left(\frac{AB}{AD}\right)^2$                       (d)  $\frac{AB}{AD}$

Q18. If E is a point on side CA of an equilateral triangle ABC such that  $BE \perp CA$ , then  $AB^2 + BC^2 + CA^2 =$

- (a)  $2BE^2$                       (b)  $3BE^2$                       (c)  $4BE^2$                       (d)  $6BE^2$

Q19. If  $\triangle ABC \sim \triangle DEF$  such that  $AB = 9.1$  cm and  $DE = 6.5$  cm. If the perimeter of  $\triangle DEF$  is 25 cm, then the perimeter of  $\triangle ABC$  is

- (a) 36 cm                      (b) 30 cm                      (c) 34 cm                      (d) 35 cm

Q20. In an isosceles triangle ABC, if  $AB = AC = 25$  cm and  $BC = 14$  cm, then the measure of altitude from A on BC is

- (a) 20 cm                      (b) 30 cm                      (c) 34 cm                      (d) 35 cm