

# REVISION TEST 05 (Trigonometry & Triangles)

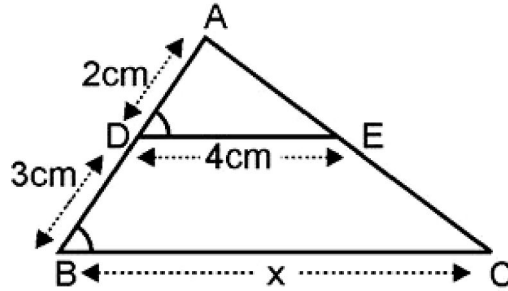
## CLASS: X : MATHEMATICS

M.M. 40 Marks

T.T. 1 hr 15 min

### SECTION – A(1 marks each)

1. If  $\triangle ABC \sim \triangle PQR$ , area of  $\triangle ABC = 81\text{cm}^2$ , area of  $\triangle PQR = 144\text{cm}^2$  and  $QR = 6\text{ cm}$ , then find the length of  $BC$ .
2. In the given figure, if  $DE \parallel BC$ , then find the value of  $x$ .



3. If  $\sin 2\theta = \cos 3\theta$ , where  $2\theta$  and  $4\theta$  are acute angles, find the value of  $\operatorname{cosec} 5\theta$ .
4. Evaluate:  $\cot^2 30^\circ - 2\cos^2 30^\circ - \frac{3}{4}\sec^2 45^\circ + \frac{1}{4}\operatorname{cosec}^2 30^\circ$

### SECTION – B(2 marks each)

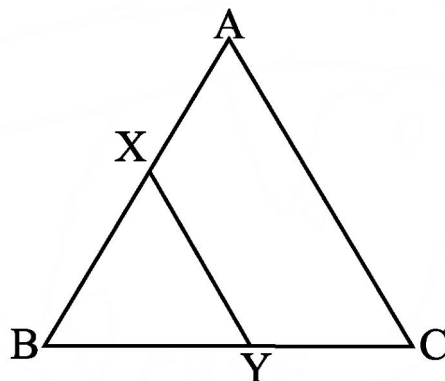
5. If the areas of two similar triangles are equal, prove that they are congruent.
6. If  $\cos (A - B) = \frac{\sqrt{3}}{2}$  and  $\sin (A + B) = 1$ , then find the value of  $A$  and  $B$ .

7. Evaluate: 
$$\frac{\tan^2 60^\circ + 4\cos^2 45^\circ + 3\operatorname{cosec}^2 60^\circ + 2\cos^2 90^\circ}{2\operatorname{cosec} 30^\circ + 3\sec 60^\circ - \frac{7}{3}\cot^2 30^\circ}$$

8. If  $A, B, C$  are interior angles of a  $\triangle ABC$ , then show that  $\operatorname{cosec}\left(\frac{A+C}{2}\right) = \sec \frac{B}{2}$ .

### SECTION – C(3 marks each)

9. In the below figure, the line segment  $XY$  is parallel to side  $AC$  of  $\triangle ABC$  and it divides the triangle into two equal parts of equal areas. Find the ratio  $\frac{AX}{AB}$ .



10. BL and CM are medians of a triangle ABC right angled at A. Prove that  $4(BL^2 + CM^2) = 5 BC^2$ .
11. Using the formula:  $\sin(A - B) = \sin A \cos B - \cos A \sin B$ , find the value of  $15^\circ$ .
12. Evaluate:  $\frac{3 \cos 55^\circ}{7 \sin 35^\circ} - \frac{4(\cos 70^\circ \operatorname{cosec} 20^\circ)}{7(\tan 5^\circ \tan 25^\circ \tan 45^\circ \tan 65^\circ \tan 85^\circ)}$

**SECTION – D(4 marks each)**

13. Prove that “The ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides.”
14. In an equilateral triangle ABC, D is a point on side BC such that  $BD = \frac{1}{3} BC$ .  
Prove that  $9AD^2 = 7AB^2$ .
15. Prove that:  $\frac{\cos A - \sin A + 1}{\cos A + \sin A - 1} = \operatorname{cosec} A + \cot A$ .
16. If  $(\tan \theta + \sin \theta) = m$  and  $(\tan \theta - \sin \theta) = n$  prove that  $(m^2 - n^2)^2 = 16mn$

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