Triangle Questions for SSC Exams (CGL Tier 1, CGL Tier 2 & SSC 10+2)

Triangle Quiz 2

Directions: Study the following questions carefully and choose the right answer:

1. The in-radius of an equilateral triangle is of length 3 cm. Then the length of each of its medians is

A. 12 cm B. $\frac{9}{2}$ cm C. 4 cm D. 9 cm

2. If the orthocentre and the centroid of a triangle are the same, then the triangle is :

A. Scalene B. Right angled C. Equilateral D. Obtuse angled

3. If in a triangle, the circumcentre, incentre, centroid and orthocentre coincide, then the triangle is

A. Acute angled B. Isosceles C. Right angled D. Equilateral

4. In a triangle, if three altitudes are equal, then the triangle is

A. Obtuse B. Equilateral C. Right D. Isosceles

5. If ABC is an equilateral triangle and D is a point on BC such that AD ⊥ BC, then

A. AB : BD = 1 : 1 B. AB : BD = 1 : 2 C. AB : BD = 2 : 1 D. AB : BD = 3 : 2

6. The side QR of an equilateral triangle PQR is produced to the point S in such a way that QR = RS and P is joined to S. Then the measure of ∠ PSR is

A. 30° B. 115° C. 60° D. 45°

7. If the circumradius of an equilateral triangle be 10 cm, then the measure of its in-radius is

A. 5 cm B. 10 cm C. 20 cm D. 15 cm

8. If the incentre of an equilateral triangle lies inside the triangle and its radius is 3 cm, then the side of the equilateral triangle is

A. $9\sqrt{3}$ cm B. $6\sqrt{3}$ cm C. $3\sqrt{3}$ cm D. 6 cm

9. In a triangle, if orthocentre, circumcentre, incentre and centroid coincide, then the triangle must be

A. obtuse angled B. isosceles C. equilateral D. right-angled

10. If ABC is an equilateral triangle and P, Q, R respectively denote the middle points of AB, BC, CA then.

A. PQR must be an equilateral triangle

B. PQ + QR + PR = AB

C. PQ + QR + PR = 2AB

D. PQR must be a right angled triangle

Correct Answers:

1	2	3	4	5	6	7	8	9	10
D	C	D	B	C	A	A	B	C	A

Explanations:

1.

In equilateral triangle centroid, incentre, orthocentre coincide at the same point.

$\therefore \frac{\text{Height}}{3}$ = in-radius

$\therefore$ Height = 3 × in-radius = 3 × 3 = 9 cm.

Hence, option D is correct.

2.

In equilateral triangle orthocentre and centroid lie at the same point.

Hence, option C is correct.

3.

In an equilateral triangle, centroid, incentre etc lie at the same point.

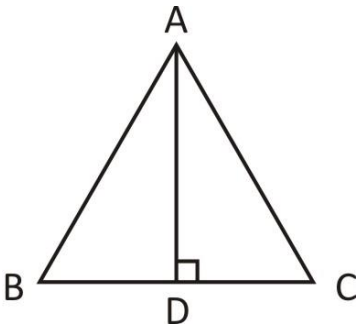
Hence, option D is correct.

4.

Triangle will be equilateral.

Hence, option B is correct.

5.



Let AB = BC = CA = 2x units

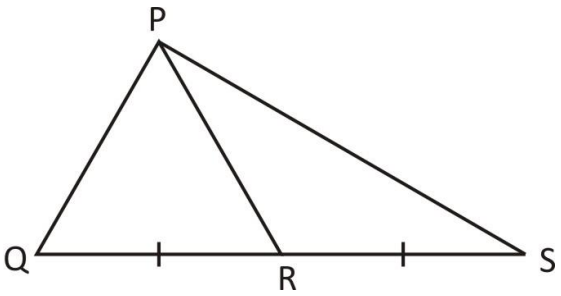
We know that a perpendicular from any vertex of an equilateral triangle bisects the opposite side.

∴ BD = CD = x units

∴ AB : BD = 2x : x = 2 : 1.

Hence, option C is correct.

6.



∠PRQ = 60° [∵ ΔPQR is an equilateral]

∠PRS = 180° – 60° = 120°

∠PSR + ∠RPS = 180° – 120° = 60° ...(i)

As QR = RS

∴ PR = RS [∵ ΔPQR is an equilateral]

∴ ∠PSR = ∠RPS

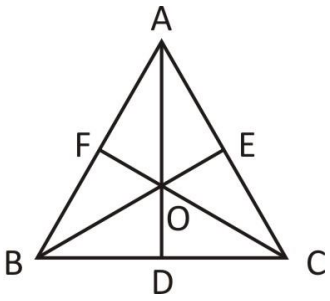
From Eq (i),

2∠PSR = 60°

∴ ∠PSR = 30°

Hence, option A is correct.

7.



Let AB = x cm

∴ BD = $\frac{x}{2}$ cm

By pythagoras theorem in ΔABD,

AD = $\sqrt{AB^2 - BD^2}$

= $x^2 - \frac{x^2}{4} = \frac{\sqrt{3}}{2}$ x cm

We know that,

In-radius = $\frac{1}{3}$ × height

∴ OD = $\frac{1}{3} \times \frac{3}{2} x = \frac{x}{2\sqrt{3}}$ cm

By pythagoras theorem in ΔBOD,

OB = $\sqrt{BD^2 + OD^2}$

= $\sqrt{\frac{x^2}{4} + \frac{x^2}{12}} = \sqrt{\frac{4x^2}{12}} = \frac{x}{\sqrt{3}}$

Given,

Circumradius, OB = 10 cm

∴ $\frac{x}{\sqrt{3}} = 10 \Rightarrow x = 10\sqrt{3}$ cm

Hence,

In-radius, OD = $\frac{x}{2\sqrt{3}} = \frac{10\sqrt{3}}{2\sqrt{3}} = 5$ cm

Hence, option A is correct.

8.

In-radius = $\frac{\text{Side}}{2\sqrt{3}}$

⇒ $3 = \frac{\text{Side}}{2\sqrt{3}}$

⇒ Side = $3 \times 2\sqrt{3} = 6\sqrt{3}$ cm

Hence, option B is correct.

9.

In an equilateral triangle, orthocentre, circum-cente, incentre and centroid coincide.

Hence, option C is correct.

10.

The line segments joining the mid points of the sides of a triangle form four triangles, each of which is similar to the original triangle.

Hence, option A is correct.