11. 360 sq. cm and 250 sq. cm are the areas of two similar triangles. If the length of one of the sides of the first triangle be 8 cm, then the length of the correspoding side of the second triangle is

6 cm

6 $^{1}/_{5}$ cm

6 $^{1}/_{3}$ cm

6 $^{2}/_{3}$ cm

Answer (d).
Property: <u>Ratio of areas of two similar triangles is equal to the ratio of squares of the corresponding sides.</u>
Assuming the unknown side to be 'a' we have
$360 : 250 = 8^2 : a^2$
$a^2 = (250 \times 64)/360 = 40/6 = 6\ ^{2}/_{3}$ cm

12. If the perimeters of an equilateral triangle and that of a square are equal, then the ratio of their areas will be

4 : 3

4 : √3

4 : 3√3

4 : 2√3

Answer (c).
Let the perimeter of square & the perimeter of triangle be A
Side of a square = A/4 and its area = $A^2/16$
Side of the triangle = A/3 and its area = $(\sqrt{3} \times A^2)/4 \times 9 = A^2\sqrt{3}/36$
The ratio - $A^2\sqrt{3}/36 : A^2/16$ or $4 : 3\sqrt{3}$

13. Length of each equal side of an isosceles triangle is 10 cm and the included angle between those two sides is 45^{o}. Find the area of the triangle.

$25\sqrt{2}$ cm^2

$35\sqrt{2}$ cm^2

$5\sqrt{2}$ cm^2

$15\sqrt{2}$ cm^2

Answer (a).
Area of trianlge = abSin c/2 where a and b are sides and c is the included angle
Area = 100 x $Sin45^{o}/2$
=> $50/\sqrt{2}$ (since Sin45 = $1/\sqrt{2}$)
=> $25\sqrt{2}$ cm^2

14. In a triangle ABC, the base BC is trisected at D and E. The line through D, parallel to AB, meets AC at F and the line through E parallel to AC meets AB at G. Let EG and DF intersect at H. What is the ratio of the sum of the area of parallelogram AGHF and the area of the triangle DHE to the area of the triangle ABC?

1 : 2

1 : 3

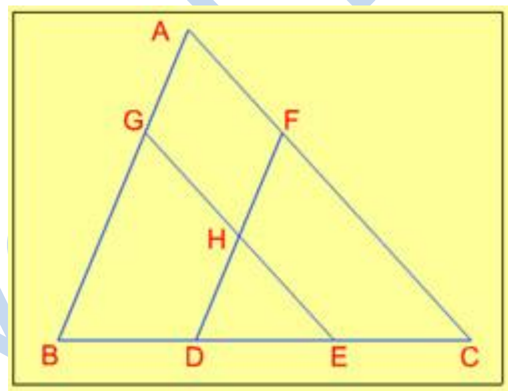
1 : 4

1 : 6

Answer (b).

Ratio of areas of two similar triangles is equal to the ratio of squares of the corresponding sides.

In the figure below, ABC, GBE, FDC and HDE are similar triangles.
Sides of triangles GBE and FDC are 2/3 of the sides of triangle ABC.
Hence if the area of the triangle ABC is assumed to be 1 sq. unit, the areas of triangles GBE and FDC would be $(2/3)^2$ i.e. 4/9.
Similarly sides of triangle HDE are 1/3 of the side of triangle ABC
Therefore the area of triangle HDE would be 1/9 of the area of triangle ABC
Area of trapezium GHDB would be 4/9 - 1/9 = 3/9
Area of parallelogram AGFH would be 1 - (3/9 + 4/9) = 2/9
Sum of the area of parallelogram AGHF and the area of the triangle DHE = 2/9 + 1/9 = 3/9 = 1/3.



Therefore the required ratio = 1/3 : 1 or 1 : 3

15. PQR is an equilateral triangle. O is the point of intersection of altitudes PL, QM and RN. If OP = 8 cm, then what is the perimeter of the triangle PQR?

$8\sqrt{3}$ cm

$12\sqrt{3}$ cm

$16\sqrt{3}$ cm

$24\sqrt{3}$ cm

Answer (d).

Altitude PL = 12 cm (see question 10 above)

In triangle PLR, angle R = 60^o and angle LPR = 30^o ,

Therefore $PL^2 = 3LR^2$

$\Rightarrow 144 = 3 \times LR^2 \Rightarrow LR = 12/\sqrt{3}$

Therefore each side = $24/\sqrt{3}$ and perimeter = $72/\sqrt{3} = 24\sqrt{3}$ cm.