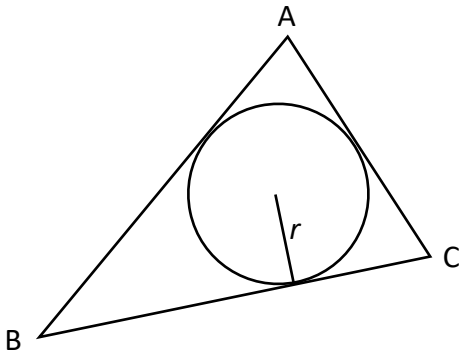
GEOMETRY TEST SOLUTIONS

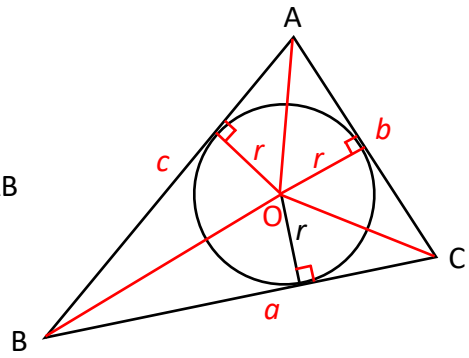
Question 1

If the area of △ABC is numerically equal to its perimeter, what is the radius, *r*, of the inscribed circle?



A. 1 B. 2 C. 3 D. 4

Solution



Draw the other two radii and join centre O to A, B and C.

Area △ABC = Area △OBC + Area △OCA + Area △OAB

$$= \frac{1}{2}ar + \frac{1}{2}br + \frac{1}{2}cr$$

$$= \frac{1}{2}r(a+b+c)$$

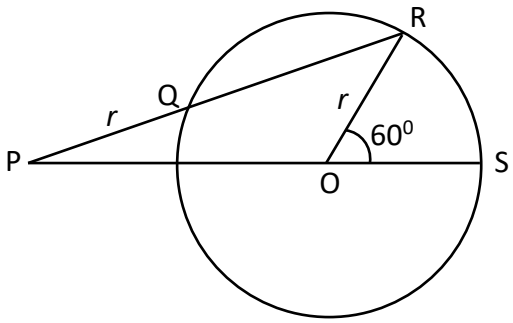
$$= \frac{1}{2}r(\text{perimeter})$$

$$\therefore r = 2$$

So, the correct answer is B.

Question 2

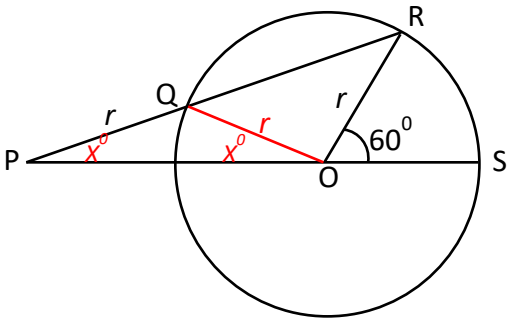
POS is a straight line through the centre of a circle of radius r cm. PQR is a straight line with PQ of length r cm. If $\angle$ROS is 60^0, what is the size of $\angle$OPQ?



A. 20^0 B. 25^0 C. 30^0 D. 60^0

Solution

Draw OQ. So ΔQPO is isosceles



If $\angle QPO = x^0$, then $\angle QOP = x^0$

$\angle OQR = 2x^0$ (ext $\angle$ of ΔOPQ)

and $\angle ORQ = 2x^0$ (ΔOQR is isos)

$\therefore x + 2x = 60$ (ext $\angle$ of ΔORP)

$\therefore x = 20$

So, the correct answer is A.

Question 3

If P(a; 11) is a point on the line $y=\frac{3}{2}x+2$ and Q(a; b) is a point on the line $2y=3x-6$, what is the value of b?

A. 3 B. 4 C. 5 D. 6

Solution

P(a; 11) lies on $y=\frac{3}{2}x+2$

$$\therefore 11=\frac{3}{2}a+2$$

$$\therefore a=6$$

Q(a; b) lies on $2y=3x-6$

$$2b=3(6)-6 \quad (a=6)$$

$$\therefore b=6$$

So, the correct answer is D.

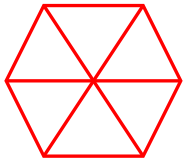
Question 4

A regular hexagon has sides of length 2 cm. What is its area?

A. $6\times\sqrt{8}$ cm^2 B. $6\times\sqrt{5}$ cm^2 C. 6×2 cm^2 D. $6\times\sqrt{3}$ cm^2

Solution

A regular hexagon is made up of 6 identical equilateral triangles



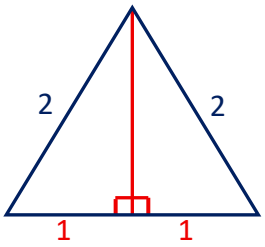
Sides of triangle are each 2 cm.

Draw perpendicular from vertex to base.

This means the vertical height is $\sqrt{3}$

So, area of $\Delta = 1 \times \sqrt{3} = \sqrt{3}$

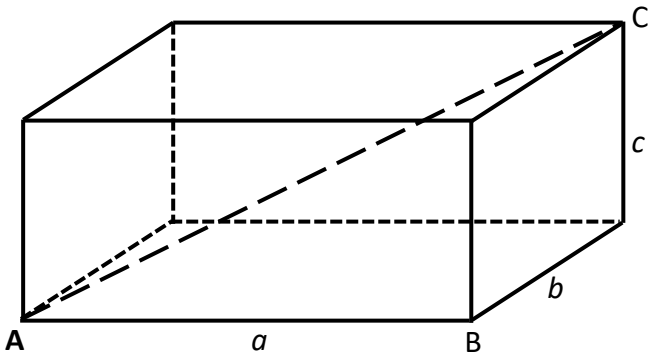
$\therefore$ Area of hexagon $= 6\sqrt{3}$



So, the correct answer is D.

Question 5

AC is the diagonal of the rectangular prism shown in the diagram. What is the length of AC?



A. $a+b+c$ B. $2a+2b+2c$ C. $\sqrt{a^2+b^2+c^2}$ D. $a^2+b^2+c^2$

Solution

Draw diagonal BC.

From the first shaded triangle

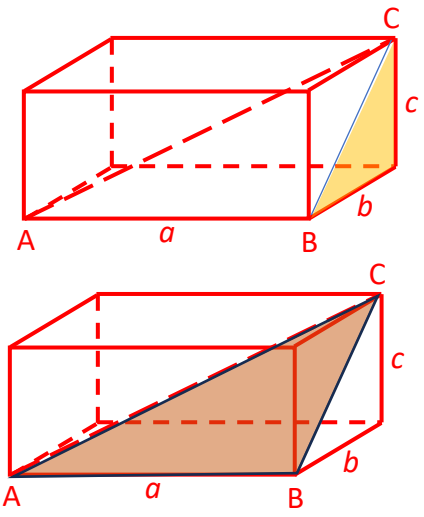
$$b^2 + c^2 = BC^2$$

Now, from the next shaded triangle

$$AC^2 = a^2 + BC^2$$

$$= a^2 + b^2 + c^2$$

$$\therefore AC = \sqrt{a^2 + b^2 + c^2}$$



So, the correct answer is C.