REVISE USEFUL CONCEPTS OF CLASS X

Q.1 $\sin 2A = 2\sin A$ is true when A =

(A*) 0° (B) 30° (C) 45° (D) 60°

Q.2 In a parallelogram, the measure of one angle is four times that of another angle. The measure of the larger angle, is

(A*) 144° (B) 72° (C) 108° (D) 54°

Q.3 An ice cream cone has a radius of 5 and a height of 8. After five hours in the sun, the ice cream melts, filling the cone up to height of 3. The volume of the melted ice cream (in cubic unit), is

(A*) $\pi\left(\frac{15}{8}\right)^2$ (B) $\frac{\pi}{3}\left(\frac{15}{8}\right)^2$ (C) $\pi\left(\frac{8}{15}\right)^2$ (D) $\frac{\pi}{3}\left(\frac{8}{15}\right)^2$

Q.4 The polynomial $x^4 - 5x^3 + 5x^2 + 5x - 6$ and $x^4 + 6x^3 + 9x^2 - 4x - 12$ have a common factor. The common factor, is

(A) $x - 2$ (B) $x + 1$ (C*) $x - 1$ (D) $x + 2$

Q.5 A pencil is essentially a cylinder surmounted by a cone. The cylinder has radius 2 mm and is 15 cm long. The length of the entire pencil is 16 cm. The volume of the pencil (in cubic millimeters), is

(A) $\frac{1460\pi}{3}$ (B) $\frac{1440\pi}{3}$ (C) $\frac{1400\pi}{3}$ (D*) $\frac{1840\pi}{3}$

Q.6 Let $x = 2 + \cfrac{1}{3 + \cfrac{1}{2 + \cfrac{1}{3 + \cfrac{1}{2 + \cfrac{1}{3 + \ldots\ldots}}}}}$

Then x equals

(A*) $1 + \frac{1}{3}\sqrt{15}$ (B) $1 - \frac{1}{3}\sqrt{15}$ (C) $\frac{1}{3} + \frac{1}{3}\sqrt{15}$ (D) $\frac{1}{3} + \sqrt{10}$

Q.7 $\sec^4 A - \sec^2 A$ is equal to

(A) $\tan^2 A - \tan^4 A$ (B) $\tan^4 A - \tan^2 A$ (C) $\tan^4 A \cdot \tan^2 A$ (D*) $\tan^2 A + \tan^4 A$

Q.8 In figure, the perimeter of ΔABC is

(A*) 30 cm (B) 60 cm

(C) 45 cm (D) 15 cm

Q.9 If $y^2 + my + 2$ is divided by $y + 1$ or by $y - 1$, the remainder are equal. The value of m, is

(A*) 0 (B) 1 (C) 2 (D) – 1

Q.10 If m is a perfect square, then the next larger perfect square is

(A*) $m+2\sqrt{m}+1$ (B) m^2+2m+1 (C) $m+1$ (D) $\sqrt{m}+1$

Q.11 If 2 is a root of the equation $x^2 + bx + 12 = 0$ and the equation $x^2 + bx + q = 0$ has equal roots, then $q =$

(A) 8 (B) -8 (C*) 16 (D) -16

Q.12 The radius of a circle is 12. Chord C lies in the circle and is a perpendicular bisector of a radius. How long is the chord C?

(A*) $12\sqrt{3}$ (B) 27 (C) $6\sqrt{3}$ (D) $3\sqrt{3}$

Q.13 If 3 men can load 21 trucks in 14 hours, how many hours will it taken 5 men to load 20 trucks? Assume that all the men work at the same speed and do not interfere with each other.

(A) $8\frac{2}{5}$ (B) $7\frac{1}{2}$ (C) $24\frac{1}{2}$ (D*) 8

Q.14 If p is the perimeter of an equilateral triangle inscribed in a circle, then the area of the circle, is

(A) $\frac{\pi p^2}{9}$ (B) $\frac{\pi p^2}{81}$ (C*) $\frac{\pi p^2}{27}$ (D) $\frac{\pi p^2\sqrt{3}}{27}$

Q.15 The value of x, satisfying the $(2)^{(4^x)} = (4)^{(2^x)}$, is

(A) $\frac{1}{4}$ (B) $\frac{1}{2}$ (C*) 1 (D) 3

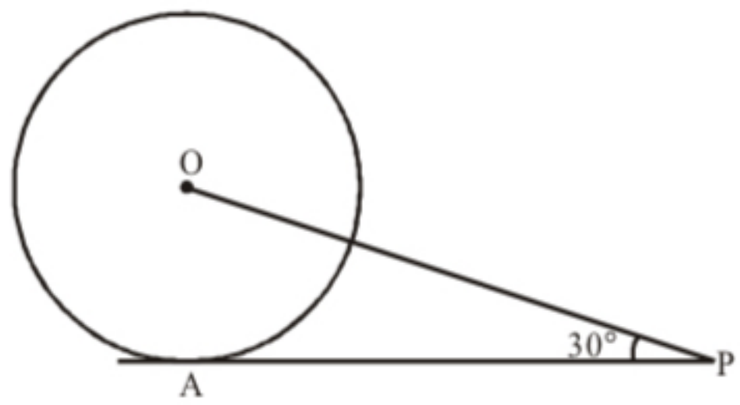
Q.16 If $a\cot\theta + b\,\text{cosec}\,\theta = p$ and $b\cot\theta + a\,\text{cosec}\,\theta = q$, then $(p^2 - q^2) =$

(A) $a^2 - b^2$ (B*) $b^2 - a^2$ (C) $a^2 + b^2$ (D) $b - a$

Q.17 Number of real solutions of the equation $|x+2| = x^2$, is

(A) 1 (B*) 2 (C) 3 (D) 4

Q.18 In figure, AP is a tangent to the circle with centre O such that OP = 4 cm and $\angle OPA = 30°$. Then, AP =



(A) $2\sqrt{2}$ cm
(B) 2 cm
(C*) $2\sqrt{3}$ cm
(D) $3\sqrt{2}$ cm

Q.19 Suppose a and b are the roots of the equation $x^2 + x - 1 = 0$. The value of $\frac{1}{a^2} + \frac{1}{b^2}$, is

(A) 5 (B*) 3 (C) 6 (D) 4

Q.20 The value of the expression, $E = \frac{\cos x}{1-\sin x} + \frac{\cos x}{1+\sin x}$, is

(A*) $\frac{2}{\cos x}$ (B) $\sin x - \cos x$ (C) $\sin x + \tan x$ (D) $2\cos x$.

Q.21 Jake's age is X years, which is also the sum of the ages of his two children. His age Y years ago was twice the sum of their ages, then $\frac{X}{Y}$, is

(A) 2 (B*) 3 (C) $\frac{3}{2}$ (D) $\frac{4}{3}$

Q.22 $9\sec^2 A - 9\tan^2 A$ is equal to

(A) 1 (B*) 9 (C) 8 (D) 0

Q.23 The number of real solutions of the equation $\left(\frac{x^2+4x}{5}\right)^{x^2-3x+2} = 1$, is

(A) 0 (B) 1 (C) 2 (D*) 3

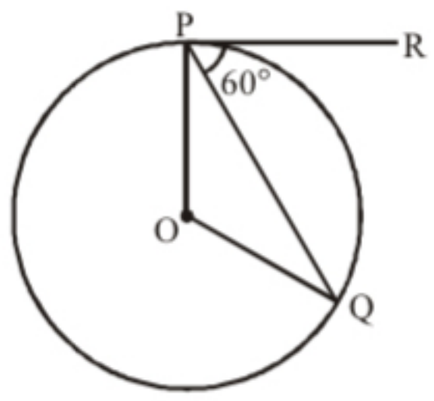
Q.24 Write the repeating decimal 0.3727272..... as a fraction.

(A) $\frac{372}{999}$ (B) $\frac{38}{101}$ (C) $\frac{136}{495}$ (D*) $\frac{41}{110}$

Q.25 The price of an item is increased by $\frac{1}{3}$. But the revenue keeps unchanged. By the percentage did the sales reduce?

(A) 10% (B) 15% (C) 20% (D*) 25%

Q.26 In figure, if PR is tangent to the circle at P and O is the centre of the circle, then $\angle POQ =$



(A) 110° (B) 100°
(C*) 120° (D) 90°

Q.27 If $\sin 3\theta = \cos(\theta - 14°)$ where 3θ is acute angle, then θ is

(A) 29° (B*) 26° (C) 24° (D) 21°

Q.28 Suppose that x and y are positive number with $xy = \frac{1}{9}$; $x(y+1) = \frac{7}{9}$; $y(x+1) = \frac{5}{18}$

The value of $(x+1)(y+1)$ equals

(A) $\frac{8}{9}$ (B) $\frac{16}{9}$ (C) $\frac{10}{9}$ (D*) $\frac{35}{18}$

Q.29 Number of real solution(s) of the equation $\sqrt{1-\sqrt{1-x}} = x$, is

(A) 0 (B) 1 (C*) 2 (D) more than two

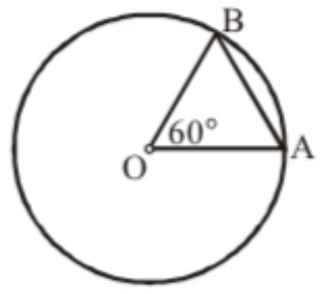
Q.30 Express the rational number $S = \cos^2(10°) + \cos^2(20°) + \cos^2(30°) + ...+ \cos^2(80°)$ in lowest terms.

(A) 2 (B) 3 (C*) 4 (D) 5

Q.31 If the sum of the roots of the equation $x^2 - (k+6)x + 2(2k-1) = 0$ is equal to half of their product, then $k =$

(A) 6 (B*) 7 (C) 1 (D) 5

Q.32 In the figure, O is the center of the circle. If AB = 5, the area of the circle, is



(A) 5π
(B) 10π
(C) 20π
(D*) 25π

Q.33 Which of the following is equal to $\sqrt[3]{108}$?

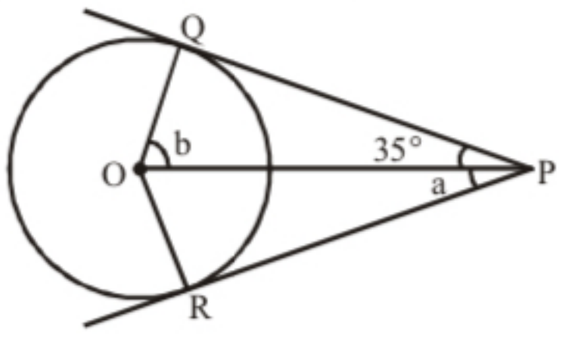
(A) $2\sqrt[3]{9}$ (B) $4\sqrt[3]{3}$ (C*) $3\sqrt[3]{4}$ (D) $6\sqrt[3]{2}$

Q.34 Let S be the set of all multiples of 6. Which of the following are subsets of S?

I. The set of all multiples of 3.
II. The set of all multiples of 9.
III. The set of all multiples of 12.

(A) I only (B*) III only (C) I and III only (D) II and III only.

Q.35 In figure, PQ and PR are tangents drawn from P to a circle with centre O. If $\angle OPQ = 35°$, then



(A) $a = 30°, b = 60°$
(B*) $a = 35°, b = 55°$
(C) $a = 40°, b = 50°$
(D) $a = 45°, b = 45°$

Q.36 If $x^2 + y^2 = 10$ and $x^2 - y^2 = 1$, then the value of $|xy|$, is

(A*) $\frac{3\sqrt{11}}{2}$ (B) 5 (C) $3\sqrt{3}$ (D) $\frac{21}{4}$

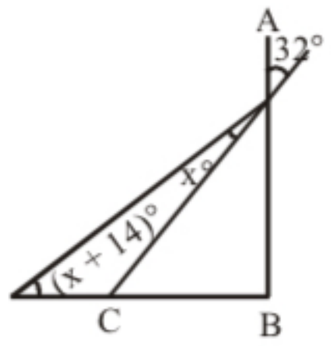
Q.37 The perimeter of an isosceles right triangle having an area of 18, is

(A) $12\left(4-\sqrt{2}\right)$ (B*) $6\left(2+\sqrt{2}\right)$ (C) $18\sqrt{2}-1$ (D) $16\sqrt{2}$

Q.38 If one root of the equation $2x^2 + kx + 4 = 0$ is 2, then the other root is

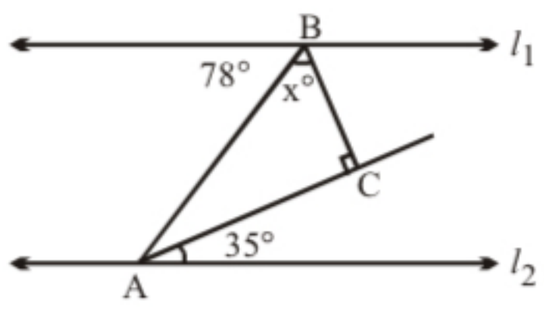
(A) 6 (B) -6 (C) -1 (D*) 1

Q.39 In figure if $AB \perp BC$, then x is equal to



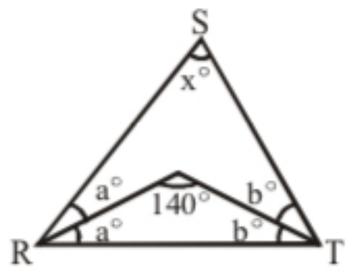
(A) 18
(B*) 22
(C) 25
(D) 32

Q.40 In figure, for which value of x is $l_1 \parallel l_2$?



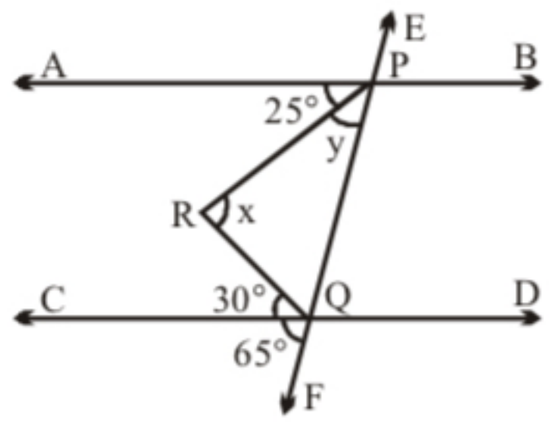
(A) 37
(B) 43
(C) 45
(D*) 47

Q.41 In ΔRST (see in figure), what is the value of x?



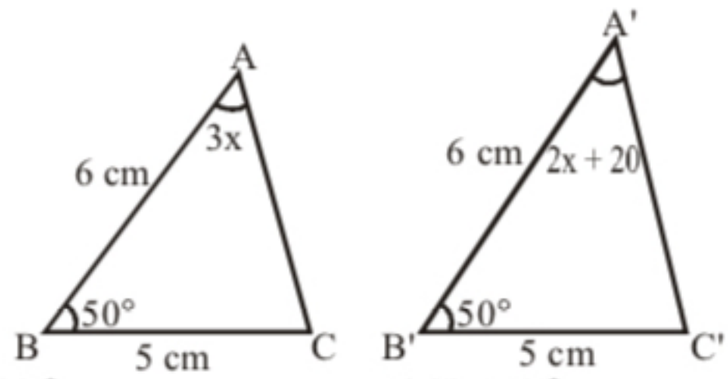
(A) 40°
(B) 90°
(C) 80°
(D*) 100°

Q.42 In figure, AB and CD are parallel lines and transversal EF intersects them at P and Q respectively. If $\angle APR = 25°$, $\angle RQC = 30°$ and $\angle CQF = 65°$, then



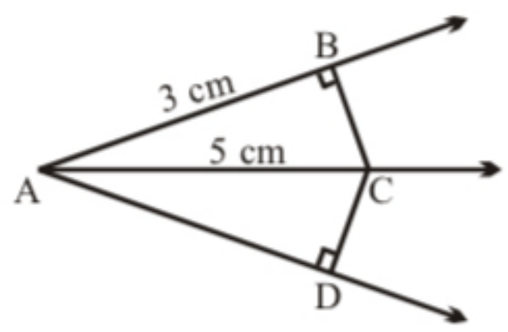
(A*) $x = 55°, y = 40°$
(B) $x = 50°, y = 45°$
(C) $x = 60°, y = 35°$
(D) $x = 35°, y = 60°$

Q.43 In figure, the measure of $\angle B'A'C'$ is



(A) 50° (B*) 60° (C) 70° (D) 80°

Q.44 In figure, if AC is bisector of $\angle BAD$ such that AB = 3 cm and AC = 5 cm, then CD =



(A) 2 cm
(B) 3 cm
(C*) 4 cm
(D) 5 cm

Q.45 The circumference of a circle is 100 cm. The side of a square inscribed in the circle is

(A) $50\sqrt{2}$ cm (B) $\frac{100}{\pi}$ cm (C*) $\frac{50\sqrt{2}}{\pi}$ cm (D) $\frac{100\sqrt{2}}{\pi}$ cm