RISE OF NATION ACADEMY

"We Create the Impeccable Creature"

Test Paper

Standard – IX (Set-A)

Subject –Mathematics

Topic – Full Course

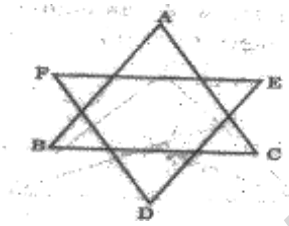
Date – 03/09/2017 **Time – 03:00 hrs.**

Max. Marks - 80 **Min. Marks – 40**

Section-A

Questions numbers 1 to 6 carry 1 mark each :

Q 1. In the figure, if $\angle A + \angle B + \angle C + \angle D + \angle E + \angle F = k$ right angles, then find the value of k is:



Q 2. If $\frac{x}{y} + \frac{y}{x} = -1, (x, y \neq 0)$, then the value of $x^3 - y^3$ is:

Q 3. The cost of petrol in a city is Rs. 40 per liter. Write as equation with x as number of liters and y total cost.

Q 4. The area of equilateral triangle is $16\sqrt{3}\ m^2$. its perimeter is

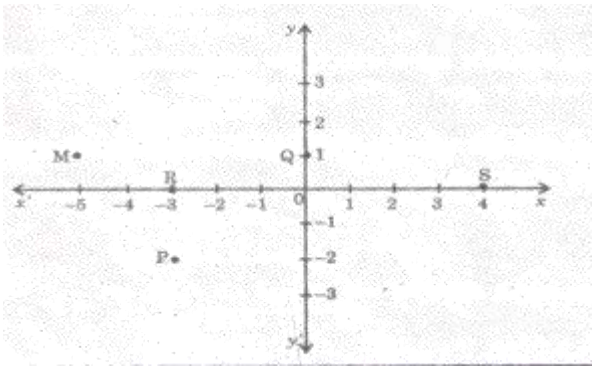
Q 5. In ΔABC, if $\angle C > \angle B$, then :

(a) $BC > AC$ (b) $AB > AC$ (c) $AB < AC$ (d) $\mathrm{BC} < AC$

Section-B

Questions numbers 7 to 12 carry 2 mark each :

Q 6. from the given figure, find the following:



(a) Coordinates of P.

(b) The abscissa of the point Q

(c) The coordinates of point R

(d) The point whose abscissa is O.

Q 7. If $\frac{\sqrt{7}-1}{\sqrt{7}+1} - \frac{\sqrt{7}+1}{\sqrt{7}-1} = a + b\sqrt{7}$, find the values of $a\ and\ b$ are rationals.

Q 8. Find the remainder when $(x - 3)$ divides the polynomial $x^2 - \sqrt{2}x + 3\sqrt{2}$.

Q 9. The value of 5.63 × 5.63 + 11.26 × 2.37 + 2.37 × 2.37 is

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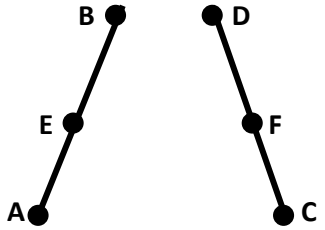
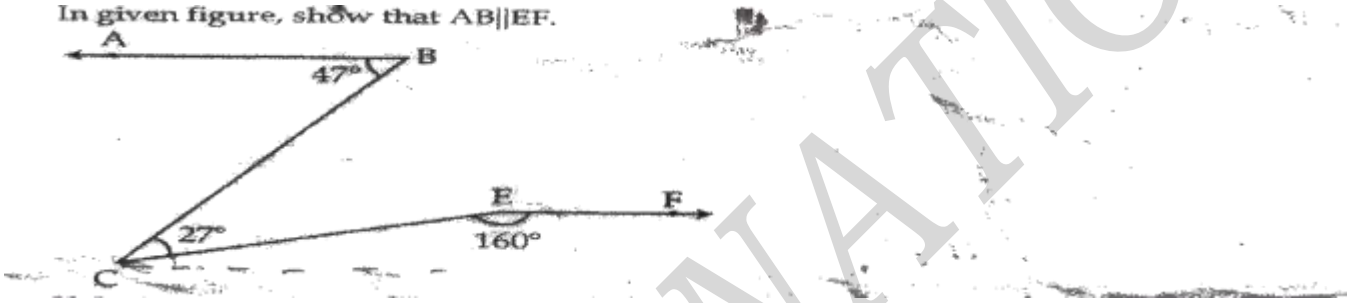
Q 10. If two lines are perpendicular to the same line, prove that they are parallel to each other.

OR

In the figure, $AE = DE, E$ is the mid-point of AB and F is the mid-point of DC. Using an Euclid's axiom, show that $AB = DC$.



Q 11.

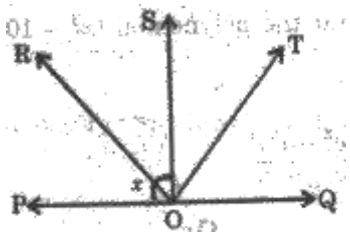


Section-C

Questions numbers 13 to 22 carry 3 mark each :

Q 12. Find the value of $(x-a)^3 + (x-b)^3 + (x-c)^3 - 3(x-a)(x-b)(x-c)$ where $a + b + c = 3x$.

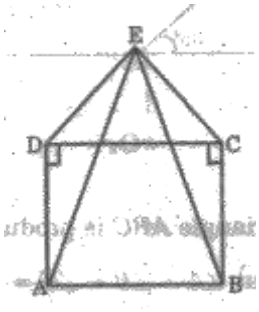
Q 13. In the following figure, ray stands on line POQ and rays OR and OT are respectively bisectors of $\angle POS$ and $\angle SOQ$. If $\angle POS = x$, find $\angle ROT$.



Q 14. The perimeter of a triangular field is 300 cm and its sides are in ratio 5 : 12 : 13. Find the length of perpendicular from the opposite vertex to the side whose length is 130 cm.

Q 15. If $a = 2\ and\ b = 3$, find the value of (I) $(a^b + b^a)^{-1}$ (II) $(a^a + b^b)^{-1}$

Q 16. In figure, $ABCD$ is a square and DEC is an equilateral triangle. Prove that



(a) $\Delta ADE \cong \Delta BCE$

(b) $AE = BE$

(c) $\angle DAE = 15°$

Q 17. Represent $\sqrt{10}$ on number line.

Q 18. Using Heron's formula, find the area of an equilateral triangle of side $'a'$ units.

Q 19. Prove Mid-Point Theorem.

Q 20. Simplify: $\frac{(a^2-b^2)^3+(b^2-c^2)^3+(c^2-a^2)^3}{(a-b)^3+(b-c)^3+(c-a)^3}$

Q 21. If x is a positive real number and exponents are rational numbers. Simplify:

$$\left[\frac{x^b}{x^c}\right]^{(b+c-a).} \times \left[\frac{x^c}{x^a}\right]^{(c+a-b)} \times \left[\frac{x^a}{x^b}\right]^{(a+b-c)}$$

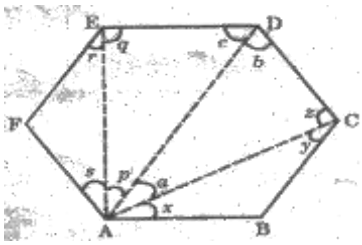
OR

Simplify $\left(\frac{x^l}{x^m}\right)^{l^2+m^2+lm} \left(\frac{x^m}{x^n}\right)^{m^2+n^2+mn} \left(\frac{x^n}{x^l}\right)^{l^2+n^2+ln}$

Section-D

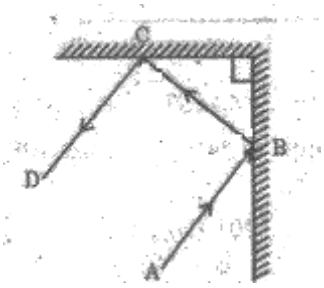
Questions numbers 23 to 30 carry 4 mark each :

Q 22. Prove that sum of the angles of a hexagon is $720°$.



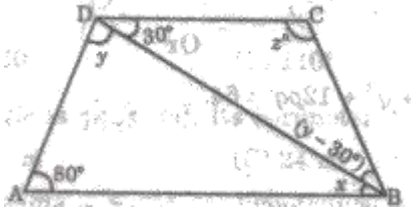
Q 23. If $x = \frac{5-\sqrt{21}}{2}$, find the value of $\left(x^3 + \frac{1}{x^3}\right) - 5\left(x^2 + \frac{1}{x^2}\right) + (x + \frac{1}{x})$.

Q 24. Two plane mirrors m and n are placed perpendicular to each other as shown in figure. An incident ray AB to the first mirror is first reflected in the direction of BC and then reflected by the second mirror in the direction of CD. Prove that $AB \parallel CD$.



OR

In figure below, $AC = AE, AB = AD \text{ and } \angle BAD = \angle EAC$, show that $BC = DE$.



Q 25. if $ax^3 + bx^2 + x - 6$ has $(x + 2)$ as a factor and leaves remainder 4, when divided by $x - 2$,find the values of a and b.

OR

Plot (-3, 0), (5, 0) and (0, 4) on certesian plane. Name the figure formed by joining these points and finds its area.

Q 26. If $x = 9 - 4\sqrt{5}$, find the value of $x^2 + \frac{1}{x^2}$.

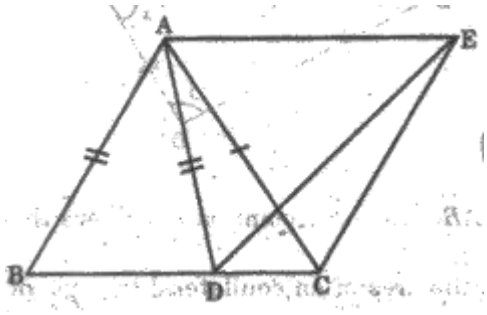
OR

If $x^2 + \frac{1}{x^2} = 34$, find the value of $x^3 + \frac{1}{x^3} - 9$

Q 27. Simplify : $\frac{2\sqrt{6}}{\sqrt{2}+\sqrt{3}} + \frac{6\sqrt{2}}{\sqrt{6}+\sqrt{3}} - \frac{8\sqrt{3}}{\sqrt{6}+\sqrt{2}}$

Q 28. if $x = \frac{\sqrt{a+2b} + \sqrt{a-2b}}{\sqrt{a+2b} - \sqrt{a-2b}}$, show that $bx^2 - ax + b = 0$.

Q 29. In the given figure, if $AB \parallel CD, \angle BDC = 30° \text{ and } \angle BAD = 80°$, find $\angle x, \angle y \text{ and } \angle z$.



OR

ABCD is a rhombus and P, Q, R and S are mid-points of the sides AB, BC, CD and DA respectively. Show that the quadrilateral PQRS is a rectangle.