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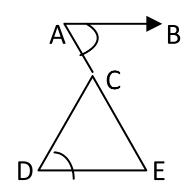
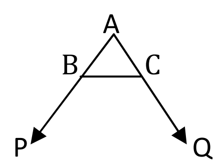
Class – IX **Sample Paper**

Time: 3hrs. **M.M.: 90marks**

SECTION – 'A' (carry one mark each)

1. Which of the following is not a whole number?
   (a) 1 (b) $\frac{1}{2}$
   (c) 0 (d) none of these
2. The value of 'k', for which the polynomial $2x^2 + kx + \sqrt{2}$ has 1 its zero, is:
   (a) $-2 + \sqrt{2}$ (b) $-\sqrt{2} + 2$
   (c) $-(\sqrt{2} + 2)$ (d) 0
3. Which of the following a zero of the polynomial: $p(x) = ax, \quad a \neq 0$
   (a) a (b) 0
   (c) 1 (d) $not\ defined$
4. The factorization of $3x^2 - x - 4$ yields:
   (a) $(x-1)(3x-4)$ (b) $(x+1)(3x+4)$
   (c) $(x+1)(3x-4)$ (d) $(-x+1)(3x-4)$
5. In fig; $AB \parallel DE$, $\angle BAC = 35°$ $and\ \angle CDE = 53°$, then $\angle DCE$ is:
   

   (a) 88° (b) 92°
   (c) 102° (d) 108°
6. In fig; side AB & AC of ΔABC are extended to a points P & Q respectively to points P & Q, also ∠PBC<∠QCB, then
   

   (a) AB>AC (b) AB=AC
   (c) AC>AB (d) AP>AQ
7. A floral design on a floor is made up of 16 tiles whose triangular sides are 9cm, 28cm and 35cm. If the area of the 16 tiles is 1411.2cm² and the cost of polishing is 50p per cm² then the total cost of polishing of 16 tiles is:
   (a) Rs 706.00 (b) Rs 705.60
   (c) Rs 705.50 (d) Rs 704.60
8. The side of an equilateral triangle whose altitude is 4cm is:
   (a) $\frac{2}{\sqrt{3}}$ (b) $3\sqrt{3}$
   (c) $\frac{8\sqrt{3}}{3}$ (d) $\frac{4\sqrt{3}}{3}$

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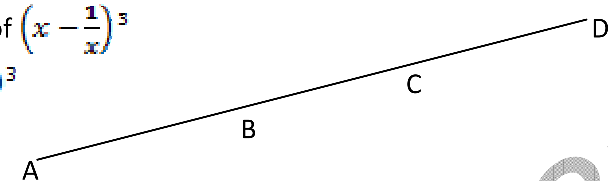
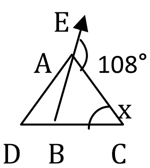
SECTION – 'B' (carry two marks each)

9. If $x = 1 - \sqrt{2}$, find the value of $\left(x - \frac{1}{x}\right)^3$
10. Factorize: $(x+2)^3 + (x-2)^3$
11. In fig; if AC=BD,
    Then prove that AB=CD

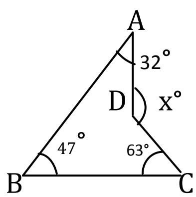


12. If $x = -\frac{1}{2}$ is a zero of a polynomial $p(x) = 8x^3 - ax^2 - x + 2$, find the value of a.
13. In fig; AB divides $\angle DAC$ in the ratio $1:3$ and AB=DB
    Determine the value of x



OR

In fig;
Find the value of x.



14. A point lies on x axis. What are its ordinates?
    If the perpendicular distances of the point from x & y axes are 3 & 2 respectively. What are its co-ordinates?

SECTION – 'C' (carry three marks each)

15. If $a = \frac{2-\sqrt{5}}{2+\sqrt{5}}$ and $= \frac{2+\sqrt{5}}{2-\sqrt{5}}$, find $a^2 - b^2$.

OR

Find the value of $\frac{6}{\sqrt{5}-\sqrt{3}}$, it being given that $\sqrt{3} = 1.732$ and $\sqrt{5} = 2.236$.

16. Simplify: $\frac{3\sqrt{2}-2\sqrt{3}}{3\sqrt{2}+2\sqrt{3}} + \frac{\sqrt{12}}{\sqrt{3}-\sqrt{2}}$

OR

Find the value of a and b if: $\frac{4+3\sqrt{5}}{4-3\sqrt{5}} = a + b\sqrt{5}$

17. Factorize : $8x^3 + 27y^3 = z^3 + 18xyz$
18. If the polynomial $ax^3 + 4x^2 + 3x - 4$ and $x^3 - 4x + a$ leave the same remainder when divided by $(x-3)$. Find the value of a.

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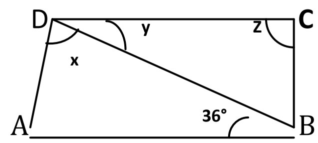
19. If the bisectors of angles ∠ABC & ∠ACB of a triangle ABC meet at a point O, then prove that $\angle BOC = 90 + \frac{1}{2}\angle A$

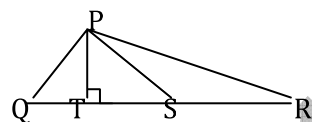
OR

If one angle of a triangle is equal to the sum of the other two, show that the triangle is a right triangle.

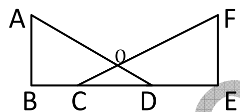
20. In fig; $AB \parallel DC$,
if $x = \frac{4}{3}y$ and $y = \frac{3}{8}z$,
Find ∠BCD, ∠ABC and ∠BAD



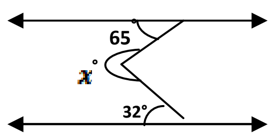
21. In fig; PS is the bisector of angle ∠QPR and $PT \perp QR$.
Show that $\angle TPS = \frac{1}{2}(\angle Q - \angle R)$



22. In fig; it is given that AB=EF, BC=DE, AB⊥BD and FE⊥CE
Prove that $\Delta ABD \cong \Delta FEC$



23. In fig;
$AB \parallel CD$
Find x



24. Find the area of a trapezium whose parallel sides are 25cm, 13cm, and other sides are 15cm and 15cm.

SECTION – 'D' (carry four marks each)

25. Simplify: $\frac{\sqrt{6}}{\sqrt{2}+\sqrt{3}} + \frac{3\sqrt{2}}{\sqrt{6}+\sqrt{3}} - \frac{4\sqrt{3}}{\sqrt{6}+\sqrt{2}}$

OR

Evaluate $\frac{15}{\sqrt{10}+\sqrt{20}+\sqrt{40}-\sqrt{5}-\sqrt{80}}$, is being given that $\sqrt{5} = 2.236$ and $\sqrt{10} = 3.162$

26. If $= \frac{1}{3-2\sqrt{2}}$, $y = \frac{1}{3+2\sqrt{2}}$, find $xy^2 + x^2y$.

OR

If $x = \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$ and $= \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$, find the value of $x^3 + y^3$.

27. Let R_1 & R_2 are the remainder when the polynomials $x^3 + 2x^2 - 5ax - 7$ and $x^3 + ax^2 - 12x + 6$ are divided by $(x + 1)$ and $(x - 2)$ respectively. If $2R_1+R_2=6$. Find the value of a.

28. Find the value of p and q so that $x^4 + px^3 + 2x^2 - 3x + q$ is divisible by $x^2 - 1$.

29. Factorize: $a^3 + 3a^2b + 3ab^2 + b^3 - 8$

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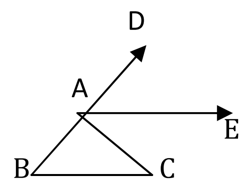
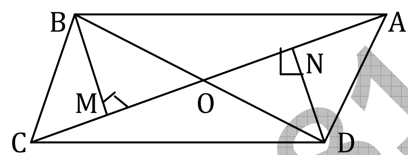
30. Plot the following ordered pairs of number (x, y) as points in the Cartesian plane. Use the scale 1cm = 1 unit on the axes.

x	-3	0	-1	4	2
y	7	-3.5	-3	4	-3

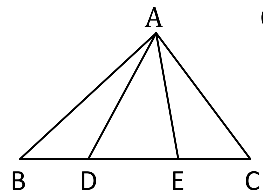
31. In fig; AE bisects
$\angle CAD$ and $\angle B=\angle C$
Prove that $AE \parallel DE$



32. In fig; BM⊥AC and DN⊥AC
such that BM=DN.
Prove that
AC bisects BD.



33. In fig; AD=AE
& BD=EC
Prove that
AB=AC.



34. If two isosceles triangle
have a common base
the line joining their vertices
bisects them at right angles.