NEW AL WUROOD INTERNATIONAL SCHOOL, JEDDAH

(PEEVEES SCHOOLS, K.S.A.)

Affiliated to CBSE – New Delhi

WORK SHEET

Subject: MATHEMATICS

CLASS: IX **DURATION:** 3 hours

NUMBER SYSTEM

1. Find five rational numbers between,
   a) -1 and -2
   b) $\frac{1}{3}$ and $\frac{2}{3}$
   c) $1\frac{1}{2}$ and $2\frac{1}{3}$
2. Find five irrational numbers between,
   a) $\frac{4}{7}$ and $\frac{6}{7}$ b) $0.\overline{45}$ and $0.\overline{46}$
3. Locate the following irrational numbers on number line.
   a) $\sqrt{5}$ b) $\sqrt{9.3}$ c) $\sqrt{10}$
4. Express each of the following decimals in the p/q form,
   a) 25.00052 b)$0.\overline{35}$ c) $0.12\overline{3}$
5. Express $0.75 + 0.\overline{6} + 0.\overline{47}$ in p/q form.
6. Rationalize the denominator of the following,
   a) $\frac{3+\sqrt{2}}{4\sqrt{2}}$ b) $\frac{3\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}}$ c) $\frac{1}{\sqrt{6}-\sqrt{5}-\sqrt{11}}$
7. Find the value of 'a' and 'b' in each of the following
   a) $\frac{3-\sqrt{5}}{3+2\sqrt{5}} = a\sqrt{5} - \frac{19}{11}$
   b) $\frac{7+\sqrt{5}}{7-\sqrt{5}} - \frac{7-\sqrt{5}}{7+\sqrt{5}} = a + \frac{7\sqrt{5}b}{11}$
8. If $a = \frac{3+\sqrt{5}}{2}$ then find the value of $a^2 + \frac{1}{a^2}$
9. If $x = 3 + 2\sqrt{2}$ then find the value of $\left(x - \frac{1}{x}\right)^3$
10. Evaluate $\frac{(36)^{\frac{7}{2}} - (36)^{\frac{-9}{2}}}{(36)^{\frac{-5}{2}}}$

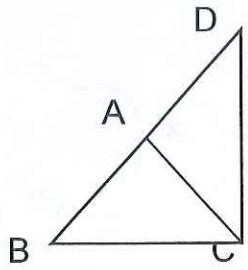
POLYNOMAILS

11. Find the value of each of the following:
    a) P(y)= $5y^2 - 4y + 5$ at y=-2
    b) P(x) =$\sqrt{2x^2} + \sqrt{2}x + 5$ $at\ x = \sqrt{2}$
    c) P(x)= $2x^3 - 3x^2 - 18x - 8$ $at\ x = 4$
12. Find the zero of the polynomial in each of the following cases:
    a) P(x) = 4x +5
    b) P(x)= (x-2)(x+2)
    c) P(x)= $x^2 + 2x + 1$
    d) P(y)= $4y^2 - 4y + 1$
13. In each of the following , using remainder theorem ,find the remainder when p(x) is divided by q(x) and verify the result by actual division:
    a) P(x)= $x^3 - 6x^2 + 11x - 6$, $q(x) = x + 2$
    b) $p(x) = 4x^3 - 12x^2 + 14x - 3$, $q(x) = x - \frac{1}{2}$
14. Find the value of k if the polynomial $2x^3 + 2kx^2 + 3x - 2k + 4$ is a multiple of x+k
15. Use the factor theorem to determine whether (x-1) is a factor of:
    a) $x^3 + 8x^2 - 7x - 2$
    b) $2\sqrt{2}x^3 + 5\sqrt{2}x^2 - 7\sqrt{2}$
16. Factorise the following:
    a) $9x^2 - 3x - 2$
    b) $x^3 - 6x^2 + 11x - 6$
17. Expand the following using identities:
    a)$(x - 2y + 4z)^2$ $b\,)(2x + 1)^3$ $c)\ \left(2x - \frac{1}{y}\right)^3$
18. Use identities to factorise the following:
    a) $2x^2 + y^2 + 8z^2 - 2\sqrt{2}xy + 4\sqrt{2}yz - 8xz$
    b) $a^3 - 8b^3 + 64c^3 + 24abc$
19. Without actually calculating the cubes find the value of the following:
    a) $50^3 + 20^3 - 70^3$
    b) $(9.8)^3 - (11.3)^3 + (1.5)^3$
20. If $x - \frac{1}{x} = 3, find\ x^3 - \frac{1}{x^3}$

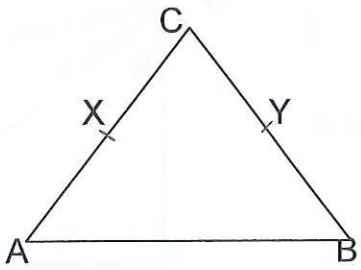
INTRODUCTION TO EUCLIDS GEOMETRY

21. Differentiate between an axiom and a postulate.
22. State Euclid's first five postulates with supporting diagrams.
23. If Q is the mid point of PR and R is a midpoint of QS, then show that QR=$\frac{1}{2}$PS

24. In the figure AB= AD and AC=AD. Prove that AB=AC. State the Euclid's axiom to support this.



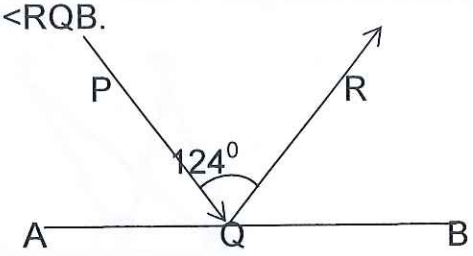
25.



In the figure X and Y are the midpoints of AC and BC and AX= CY. Show that AC=BC.

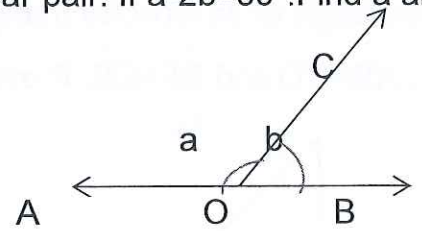
LINES AND ANGLES

26. In figure PQ is an incident ray on plane mirror ABQ, and QR is reflected ray. If $<PQR = 124^0$, then find the value of <RQB.

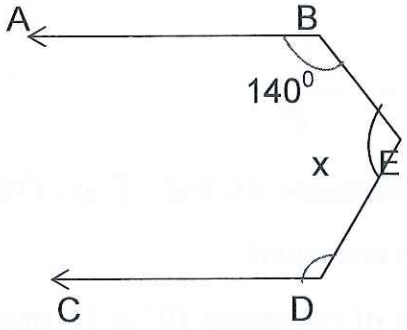


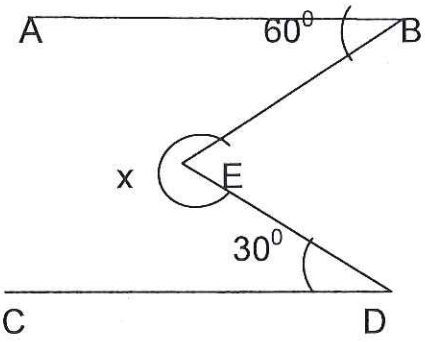
27. It is given that $<XYZ = 64^0$ and XY is produced to point P. Draw a figure from the given information. If ray YQ bisect <ZYP , find <XYQ and reflex <QYP.

28. In figure <AOC and < BOC form a linear pair. If $a-2b=30^0$.Find a and b.



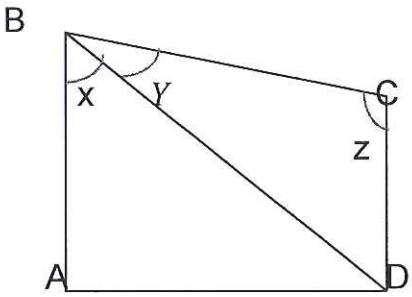
29. In each of the following figures, AB//CD. Find the value of x in each case.



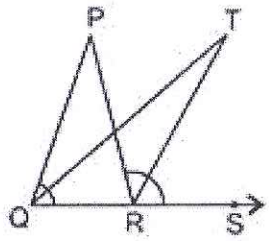


30. In the figure ,AB// DC.

If $x=\frac{4}{3}y$ *and* $y=\frac{3}{8}z$, *find the value of* x, y *and* z



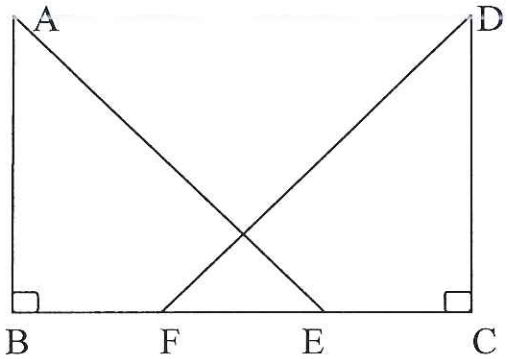
31. In figure the side QR of ΔPQR is produced to a point S. If the bisectors of <PQR and <PRS meet at point T, then prove that $< QTR = \frac{1}{2} < QPR$.



TRIANGLES

32. The verticle angle of an isoscles triangle is 86^0. Find the base angles.

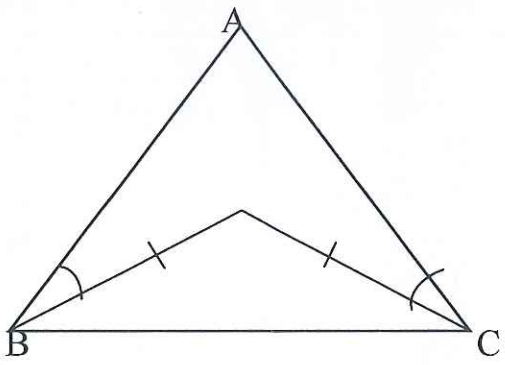
33. In figure ; AB=CD and BF=CE. Prove that AE=DF.



34. ABC is an equilateral triangle in which altitudes BE and CF are drawn to sides AC and AB respectivly. Show that these altitudes are equal.

35. In ΔABC, <B = <C . If AD is the bisector of <A meets BC at D, prove that D is the midpoint of BC and AD perpendicular to BC.

36.In the given figure < ABD = <ACD and BD= CD. Prove that AB=AC



37.D is any point on side AC of a triangle ABC with AB= AC. Show that CD< BD.

38. S is any point on side QR of triangle PQR.Show that PQ+QR +RP =2PS

COORDINATE GEOMETRY

39. Plot the following points and write the name of the figure obtained by joining them in order:

P(-3,2), Q(-7,-3), R(6, -3), S(2,2)

40. without plotting the points indicate the quadrent in which they will lie, if:

a) Ordinate is 4 and abscissa is -5

b) Abscissa -2 and ordinate is -3

c) Abscissa -4 and ordinate is 3

d) Abscissa 6 and ordinate is 4

41. Find the cordinates of the point:

a) Which lies on x and y-axes both

b) Whose ordinate is -5 and which lie on y-axis

c) Whose abscissa is 4 and which lies on x-axis