

# INTERNATIONAL INDIAN SCHOOL DAMMAM

MATHEMATICS WORK SHEET 2017-18

TERM-1

CLASS IX

## NUMBER SYSTEMS

1. Visualize 3.756 on the number line, using successive magnification

2. Represent  $\sqrt{3.5}$  on the number line

3. Express  $0.12\overline{54}$  in the form  $p/q$

4. If  $x = 3 + 2\sqrt{2}$ , find the value of  $x^2 + \frac{1}{x^2}$  ?

5. If  $x = 2 + \sqrt{5}$ , Prove that  $x^2 + \frac{1}{x^2} = 18$

6. If a and b are rational numbers, find a and b

a)  $\frac{\sqrt{2} + \sqrt{3}}{3\sqrt{2} - 2\sqrt{3}} = a + b\sqrt{6}$   
b)  $\frac{\sqrt{5} - 2}{\sqrt{5} + 2} - \frac{\sqrt{5} + 2}{\sqrt{5} - 2} = a + b\sqrt{5}$   
c)  $\frac{5 + 2\sqrt{3}}{7 + 4\sqrt{3}} = a + b\sqrt{3}$

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

8. If  $a = 9 - 4\sqrt{5}$ , find the value of  $[a - 1/a]^2$

9. If  $x = 1 - \sqrt{2}$ , find the value of  $[x - 1/x]^3$

10. If  $x = 0.125$ , find the value of  $(1/x)^{1/3}$

11. If  $x = \frac{1}{2 - \sqrt{3}}$ , find the value of  $2x^3 - 2x^2 + 7x + 5$

12. Find four rational numbers between  $3/5$  and  $4/5$

13. Find two irrational numbers lying between  $\sqrt{2}$  and  $\sqrt{3}$

14. Simplify  $(81/16)^{3/4} \times [(25/9)^{-3/2} \div (5/2)^{-3}]$ .

15. Simplify:  $\frac{(25)^{3/2} \times (243)^{2/5}}{(16)^{5/4} \times (8)^{4/3}}$

16. Find the value  $x$ , if  $5^{x-3} \times 3^{2x-8} = 225$

17. Solve for  $x$ : a)  $49 \times 7^x = (343)^{1/3}$

b)  $2^x = (128)^{1/7} \times (\sqrt{2})^4$

c)  $3^x = \frac{9}{27^x}$

d)  $(1/7)^{4-2x} = \sqrt{7}$

18. If  $x = \frac{\sqrt{3}+1}{\sqrt{3}-1}$ ,  $y = \frac{\sqrt{3}-1}{\sqrt{3}+1}$ , then find the value of  $x^2 + xy + y^2$

19. Simplify:  $\frac{36^{7/2} - 36^{9/2}}{36^{5/2}}$

20. Simplify: a)  $\sqrt{45} + \sqrt{80} - 3\sqrt{20}$

b)  $7\sqrt{6} - \sqrt{252} - \sqrt{294} + 6\sqrt{7}$

c)  $4\sqrt{28} + 3\sqrt{7}$

21. Express  $2.9999\dots$  in the form of  $p/q$ .

22. Find the value of  $\frac{3^{30} + 3^{29} + 3^{28}}{3^{31} + 3^{30} - 3^{29}}$

23. Find the value of  $\frac{\sqrt{48} + \sqrt{32}}{\sqrt{27} + \sqrt{18}}$

24. Express  $\overline{1.32} + \overline{0.35}$  as a fraction in simplest form.

25. Find two rational and irrational numbers between  $0.4101$  and  $0.4222$

INTERNATIONAL INDIAN SCHOOL      DAMMAM  
MATHEMATICS WORKSHEET    2017-2018

Polynomials

CLASS - IX

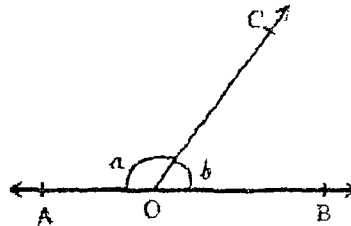
---

1. If the polynomial  $3x^4 - 4x^3 - 3x - 1$  is divided by  $x - 1$ ; find the remainder
2. Find the value of "p" if  $x + 3$  is a factor of  $2x^3 - 3px^2 + p + 3$
3. Find the value of "m" if  $x + 3$  is a factor of  $3x^2 + mx + 6$
4. If -4 is the zero of the polynomial  $p(x) = x^2 + 11x + k$ ; then find the value of "k"
5. If  $x = 0$ ;  $x = 2$  are zeroes of polynomial  $2x^3 - 5x^2 + px + b$ ; then find "p" & "b"
6. Find the remainder when  $p(x) = x^3 - 6x^2 + 2x - 4$  is divided by  $q(x) = 1 - 2x$
7. The polynomials  $ax^3 + 3x^2 - 3$  and  $2x^3 - 5x + a$  leave same remainder in each case when divided by  $x - 4$ ; find the value of "a"
8. Write the expanded form of  $(x - y)^3$  and use it to find  $99^3$
9. Using suitable identity evaluate  
(a)  $102^3 - 2^3$       (b)  $103^3$       (c)  $106^3 - 94^3$       (d)  $249 \times 251$       (e)  $42^3 - 18^3 - 24^3$
10. If  $x - 3$  and  $x - 1/3$  are both factors of  $ax^2 + 5x + b$ ; show that  $a = b$
11. Factorise the below  
(a)  $27p^3 - \frac{1}{216} - \frac{9}{2}p^2 + \frac{1}{4}p$       (b)  $2y^3 + y^2 - 2y - 1$   
(c)  $a^6 - b^6$       (d)  $x^3 - 13x^2 + 32x + 20$   
(e)  $4a^2 - 9b^2 - 2a - 3b$       (f)  $(a^2 - b^2)^3 + (b^2 - c^2)^3 + (c^2 - a^2)^3$
12. If  $a + b + c = 9$ ;  $ab + bc + ac = 26$ ; find  $a^2 + b^2 + c^2$
13. If  $a + b + c = 6$ ;  $ab + bc + ca = 1$ ; find  $a^3 + b^3 + c^3 - 3abc$
14. If  $a + b = 11$ ;  $ab = 28$  find the value of  $a^3 + b^3$
15. Show that  $2x + 1$  is a factor of polynomial  $2x^3 + x^2 - 6x - 3$ . Hence the factorise the polynomial
16. Find common factor in polynomials  $x^2 + 8x + 15$  and  $x^2 + 3x - 10$
17. Divide  $p(x) = x^4 - 13x^3 + 29x^2 + 12x - 30$  by  $q(x) = x + 1$ ; Also find what should be subtracted from  $p(x)$  so that it is divisible by  $q(x)$
18. The volume of a cuboid is  $p(x) = x^3 + 13x^2 + 32x + 20$ ; find the possible expressions for dimensions of the cuboid.

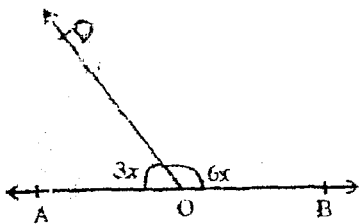
MATHEMATICS WORKSHEET 2017-2018

LINES AND ANGLES

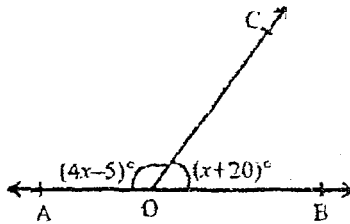
1. If an angle is  $24^\circ$  less than its complement, find its measure.
2. An angle is  $40^\circ$  less than one-third of its supplement. Find the angle and its supplement.
3. Two supplementary angles are in the ratio 11 : 7. Find them.
4. Find the angle whose supplement is four times its complement.
5. Find the measure of an angle if, three times its supplement is  $60^\circ$  more than six times its complement.
6. In the following figure, it is given that  $2a - 5b = 10^\circ$  find  $a$  and  $b$ .



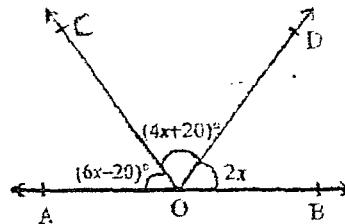
7. In the following figures, what value of  $x$  will make AOB a straight line?



(i)

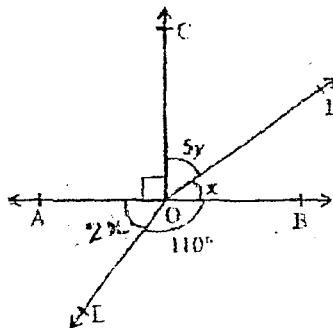


(ii)



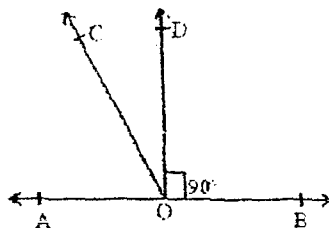
(iii)

8. In the following figure,  $\angle COA = 90^\circ$  and AOB is a straight line. Find  $x$  and  $y$ .

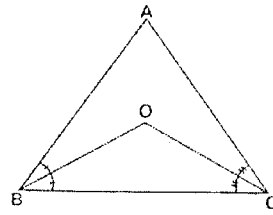


9. Prove that the bisectors of the angles of a linear pair are at right angles.
10. If the bisectors of two adjacent angles form a right angle then prove that their non-common arms are in the same straight line.
11. In given figure, AOB is a line. Ray OD is perpendicular to AB. OC is another ray lying between OA and

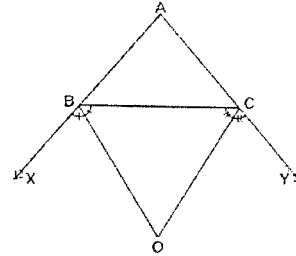
OD. Prove that  $\angle DOC = \frac{1}{2} (\angle BOC - \angle AOC)$



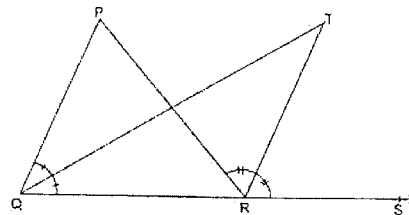
**Q10:** The bisectors of  $\angle B$  and  $\angle C$  meet at  $O$ . Prove that  $\angle BOC = 90^\circ + \frac{1}{2} \angle A$ .



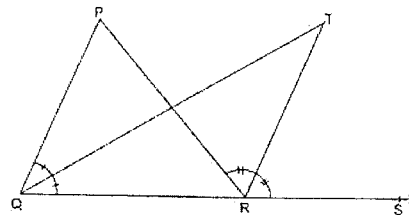
**Q11:** The bisectors of the exterior angles  $\angle CBX$  and  $\angle BCY$  meet at  $O$ . Prove that  $\angle BOC = 90^\circ - \frac{1}{2} \angle A$ .



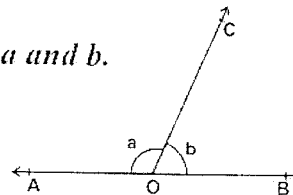
**Q12:** PQRS is a parallelogram. The bisectors of  $\angle P$  and  $\angle Q$  meet at  $O$ . Prove that  $\angle POQ = 90^\circ$ .



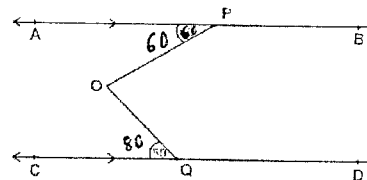
**Q13:** The bisectors of  $\angle PQR$  and  $\angle PRS$  meet at  $O$ . Prove that  $\frac{1}{2} \angle QTR = \frac{1}{2} \angle QPR$ . If  $\angle QTR = 40^\circ$  find  $\angle QPR$ .



**Q14:** AOB is a straight line. If  $a - b = 40^\circ$  find  $a$  and  $b$ .

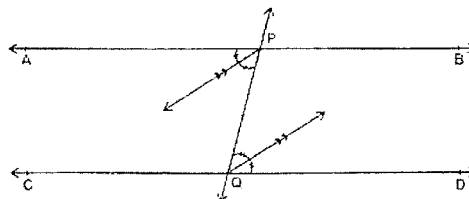


**Q15:**  $AB \parallel CD$ .  $\angle APO = 60^\circ$   
 $\angle CQO = 80^\circ$ . Find reflex  $\angle POQ$ .

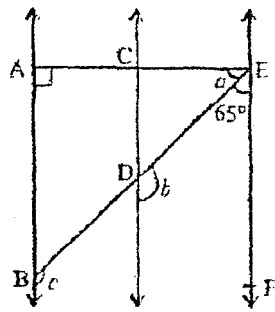


**Q16:** Two lines are intersected by transversal such that the bisectors of a pair of corresponding angles are equal. Prove that the lines are parallel.

**Q17:** Lines AB and CD are intersected by the transversal PQ such that the bisectors of  $\angle APQ$  and  $\angle DQP$  are parallel. Prove that  $AB \parallel CD$ .



17. In the following figure,  $AB \parallel CD \parallel EF$ . Also  $EA \perp AB$ . If  $\angle BEF = 65^\circ$ , find the value of  $a$ ,  $b$  and  $c$ .



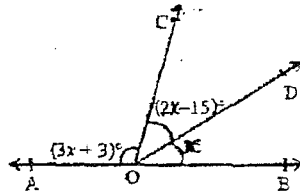
18. The angles of a triangle are  $\left(\frac{x}{2} + 50\right)^\circ$ ,  $\left(\frac{x}{3} + 60\right)^\circ$  and  $(2x - 15)^\circ$ , find the angles.

19. If a transversal cuts two parallel lines and is perpendicular to one of them, show that it will be perpendicular to the other also.

20. If two parallel lines are intersected by a transversal, show that the bisectors of any corresponding angles are parallel.

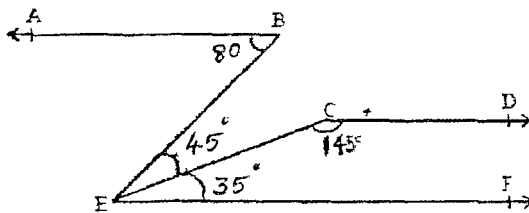
1.

What value of  $x$  would make AOB a straight line?



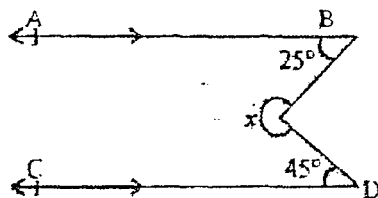
12.

In the given figure, show that  $AB \parallel CD$ .



23.

Find the value of  $x^\circ$ , it is given that  $AB \parallel CD$ .

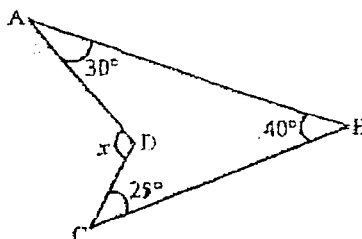
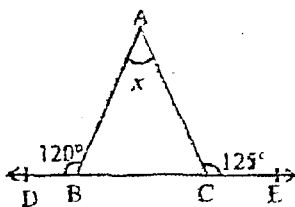


24. Angles A, B and C of a triangle satisfy  $B - A = 30^\circ$  and  $C - B = 45^\circ$ . Find all the angles.

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

26. One of the angles of a triangle is  $55^\circ$ . Find the remaining two angles, if their difference is  $35^\circ$ .

27. In the given figures find  $x$ :



**INTERNATIONAL INDIAN SCHOOL , DAMMAM**

**MATHEMATICS WORKSHEET**

**CLASS : IX**

**2017-18**

**TOPICS: Heron's Formula, Introduction to Euclid's Geometry, Co-ordinate geometry**

1. Find the cost of laying grass in a triangular plot of sides 50m, 65m, 65m at the rate of Rs.7 per sq.m .
2. The perimeter of an isosceles triangle is 32cm. The ratio of the equal sides to its base is 3:2. Find the area of the triangle.
3. A field in the form of a parallelogram has sides 60m and 40m and one of its diagonals is 80m. Find the area of the parallelogram.
4. The sides of a quadrilateral ABCD are 6cm, 8cm, 12cm and 14cm and the angle between the first two sides is  $90^\circ$ . Find its area.
5. The sides of a triangular plot are in the ratio of 3:5:7 and its perimeter is 300m. Find the area.
6. ABCD is an isosceles trapezium whose parallel sides AD and BC are 10cm and 25cm,  $AB = DC = 15$ cm. Find the area of the trapezium.
7. The perimeter of the triangle is 50cm. One side of the triangle is 4cm longer than smaller side and third side is 6cm less than twice the smaller side. Find the area of the triangle.
8. The area of a trapezium is  $475\text{cm}^2$  and the height is 19cm. Find the lengths of its two parallel sides if one side is 4cm greater than the other.
9. The two parallel sides of a trapezium are 120 cm and 154 cm and other sides are 50cm and 52cm. Find the area of the trapezium.
10. A rhombus sheet whose perimeter is 32m and whose one diagonal is 10m long , is painted on both sides at the rate of Rs. 5 per sq.m. Find the cost of painting.
11. State two postulates and axioms of Euclid's.
12. Illustrate the fifth postulate with three different cases when the two lines meet if it is intersected by another line.

13. Plot the points  $A(-2,3)$ ,  $B(-2,0)$ ,  $C(2,0)$ ,  $D(2,6)$  on a graph paper and join them continuously and find the length of  $AC$  and  $AD$ .

14. In which quadrant or on which axis do each of the points  $(-3,4)$ ,  $(2,1)$ ,  $(1,0)$ ,  $(2,2)$ ,  $(-3,5)$ ,  $(0,4)$ ,

$(-6,-5)$ ,  $(-2,0)$

15. Write the co-ordinates of the point

a. Above the x-axis lying on y-axis at a distance of 3 units.

b. Right of the origin and on x-axis at a distance of 2 units.

c. Abscissa is  $-4$  and ordinate is  $5$

d. origin

e. The point is at a distance of 2 units from the y-axis and 3 units from x-axis.

f. x-coordinate is  $1$  and y-coordinate is  $-3$

g. ordinate is  $-5$  and it is on y-axis

15. Show that a line segment has one and only one mid point.

16. If  $AC = BD$ , show that  $AB = CD$  stating the related axiom for it.

