

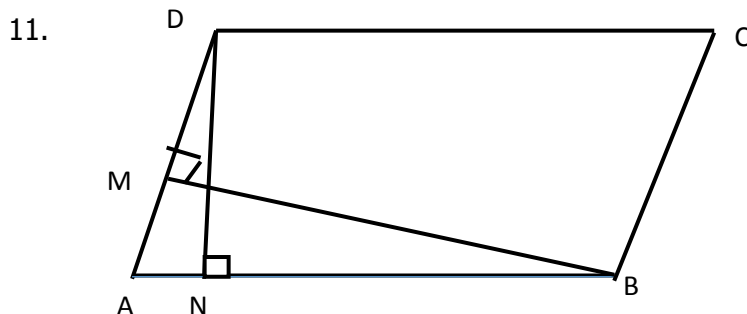


INDIAN SCHOOL AL WADI AL KABIR

Dept. Of Mathematics 2017-18, Class IX

HOLIDAY HOME WORK

1. Points A(4,2), B(-1,2) and D(4,-5) are the three vertices of rectangle ABCD. Plot these points and hence find the vertex C. Ans. C(-1,-5)
2. A transversal intersects two parallel lines. Prove that the bisectors of any pair of corresponding angles so formed are parallel.
3. Prove that sum of the three angles of a triangle is 180° . Using the result, find the value of x and all the three angles of a triangle, if the angles are $(2x - 7)^\circ$, $(x + 25)^\circ$ and $(3x + 12)^\circ$.
Answers: $x = 25$ and angles are 43° , 50° , 87°
4. ABCD is a rhombus in which P, Q, R and S are the midpoints of sides AB, BC, CD and DA respectively. Prove that the quadrilateral PQRS is a rectangle.
5. The taxi fare in a city is as follows: For the first kilometre, the fare is ₹ 8 and for the subsequent distance is ₹ 5 per kilometre. Taking the distance covered as x km and total fare as ₹ y, write a linear equation for the given information in two variables and draw its graph. (Ans. $5x - y + 3 = 0$)
6. Give the geometric representations of $x = -5$ as linear equation.
 - (i) In one variable
 - (ii) In two variables
7. The lengths of the two adjacent sides of parallelogram are 51cm and 37cm respectively. One of its diagonals is 20cm. Find the area of the parallelogram. (Ans. : 612 sq. cm)
8. AD and BE are respectively the altitudes of triangle ABC with $AB = AC$. Prove that $AE = BD$.
9. Factorise the following completely.
 - (a) $x^3 + 9x^2 + 23x + 15$: Ans. $(x + 1)(x + 3)(x + 5)$
 - (b) $2x^3 - 5x^2 + x + 2$: Ans. $(x - 1)^2(2x + 1)$
 - (c) $x^3 - 7x + 6$: Ans. $(x - 1)(x - 2)(x + 3)$
10. Express y in terms of x in the linear equation $4x + 5y = 20$.
For the same linear equation find the value of x when $y = -4$. (Ans. $y = \frac{20-4x}{5}$ and $x = 10$)



In the above figure ABCD is a parallelogram. DN is perpendicular to AB and BM is perpendicular to AD. $CD = 20\text{cm}$, $AD = 12\text{cm}$ and $BM = 15\text{cm}$. Find the length of DN. (Ans. 9 cm).

12. Prove that two parallelograms lying on the same base and between same parallels are equal in areas.

13. Simplify: $\sqrt[4]{\left(\frac{132}{143}\right)^{-2}}$ (Ans. $\frac{\sqrt{13}}{2\sqrt{3}}$)

14. Without actually calculating cubes and using suitable identity.
Evaluate: $14^3 + 13^3 + (-27)^3$ (Ans.-14742)

15. Find the values of k if the polynomial $p(x) = x^4 - 2x^3 + 3x^2 - kx + 3k - 7$ when divided by $(x - 1)$ leaves the remainder 19. Also find the remainder when $p(x)$ is divided by $(x + 2)$.

(Ans. $k = 12$ and remainder = 41)

16. Simplify: $\frac{\sqrt{7} + \sqrt{5}}{\sqrt{7} - \sqrt{5}} + \frac{\sqrt{7} - \sqrt{5}}{\sqrt{7} + \sqrt{5}}$ (Ans. 12)

17. Represent $\sqrt{7.5}$ on the number line.

18. Find a and b, if $\frac{2\sqrt{5} + \sqrt{3}}{2\sqrt{5} - \sqrt{3}} + \frac{2\sqrt{5} - \sqrt{3}}{2\sqrt{5} + \sqrt{3}} = a + b\sqrt{15}$ Ans. $a = 46$ and $b = 0$

19. Construct ΔABC in which $AB + BC + AC = 11.5$ cm, $\angle B = 90^\circ$ and $\angle C = 60^\circ$

20. In triangle PQR, bisectors of exterior angles at Q and R meet at M. Then prove that

$$\angle RMQ = 90^\circ - \frac{1}{2} \angle P$$

