

Army Public School, Ranikhet

CLASS – IX

Mathematics

2020-21

Winter Holiday Home Work Question Paper – I

and

Project Work

Max.Marks:80

QP Code : DCP -15

Duration:3 hours

General Instructions:

1. Section A has 15 questions carry 1 mark each.
2. Section B has 10 questions carry 2 marks each.
3. Section C has 15 questions carry 3 marks each.
4. Section D has 4 questions carry 5 marks each.
5. Attempt all the questions.

SECTION - A

Question numbers 1 to 15 carry 1 mark each.

- 1 Give one example each of a binomial of degree 21, and of a monomial of degree 101. 1
- 2 How many least number of distinct points determine a unique line ? 1
- 3 Write the following as an equation in two variables : $y = 3$ 1
- 4 Give two examples of two lines passing through $(-3, 5)$. 1
- 5 Find the value of k , if $x = -2$ and $y = 3$ is a solution of the equation $3x - 2yk = 5$. 1
- 6 The cost of a pen is thrice the cost of a pencil. Write a linear equation in two variables to represent this statement. 1
- 7 Find the zero of the polynomial $p(x) = 2x + 5$. 1
- 8 Factorise : $3x^3 - 3x$. 1
- 9 Rationalise the denominator : $\frac{3}{2\sqrt{7}}$. 1
- 10 Simplify : $(3 - \sqrt{5})(2 + 3\sqrt{3})$ 1
- 11 Simplify : $(\sqrt{2} + 3\sqrt{3})^2$. 1
- 12 Write the measure of the angle between the coordinate axes.. 1
- 13 Define the term : a) Parallel Lines b) Collinear Points 1
- 14 Write the value of $(a)^b$ if $a = 2$ and $b = 3$. 1
- 15 Define an irrational numbers with examples. 1

SECTION – B

Question numbers 16 to 25 carry 2 marks each.

- 16 An exterior angle of a triangle is 110° and one of the interior opposite angles is 30° . Find the other two angles of the triangle. 2
- 17 If two lines intersect, then prove that vertically opposite angles are equal. 2
- 18 If $(x + 1)$ is a factor of $x^3 + a$, then write the value of a . 2
- 19 Factorise : $x^3y^3 + 1$. 2
- 20 In two congruent triangles ABC and DEF, if $AB = DE$ and $BC = EF$. Name the pairs of equal angles. 2
- 21 In a ΔABC , if $\angle A = 50^\circ$ and $\angle B = 60^\circ$, determine the shortest and the longest sides of the triangle.. 2
- 22 If the angles of a triangle are in the ratio $2 : 1 : 3$, then find the measure of smallest angle. 2

- 23 An angle is equal to 8 times its complement. Determine its measure. 2
- 24 Express in the form $\frac{p}{q}$: $0.12\bar{3}$ 2
- 25 If $x + \frac{1}{x} = 5$, find $x^2 + \frac{1}{x^2}$. 2

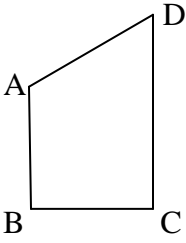
SECTION – C

Question numbers 26 to 39 carry 3 marks each.

- 26 Write four solutions for the equation : $3x - 9 = 4y$ 3
- 27 Name the quadrant/axis for the points : a) $(-4, -5)$ b) $(0, 5)$ c) $(2, -3)$ d) $(2, 4)$ 3
- 28 Expand using identities : a) $(3x - 4y)^2$ b) $(4x + 6y)^2$ 3
- 29 Expand using identities : a) $(3x - 4y + 4p)^2$ b) $(x - 2y)^3$ 3
- 30 Factorise : $25x^2 - 12 + 13x$ 3
- 31 Evaluate using suitable identity - a) $(997)^3$ b) $(101)^2$ 3
- 32 What are the possible expressions for the dimensions of the cuboid whose volume is : $3x^2 - 12x$ 3
- 33 Factorise : a) $1 - 2ab - (a^2 + b^2)$ b) $4x^2 - 9y^2$ 3
- 34 Show how $\sqrt{5}$ can be represented on the number line. 3
- 35 Find 5 rational numbers between $\frac{3}{5}$ and $\frac{1}{4}$ 3
- 36 Factorise : $8x^3 + 27y^3 + z^3 - 18xyz$ 3
- 37 The sides BC, CA and AB of a $\triangle ABC$ are produced in order, forming exterior angles $\angle ACD$, $\angle BAE$ and $\angle CBF$. Show that $\angle ACD + \angle BAE + \angle CBF = 360^\circ$ 3
- 38 Find a and b if : $\frac{5+3\sqrt{3}}{7+4\sqrt{3}} = a + b\sqrt{3}$ 3
- 39 Simplify : $\frac{2-3\sqrt{5}}{3+5\sqrt{5}}$ 3
- 40 If $x^2 + \frac{1}{x^2} = 7$, find $x^3 + \frac{1}{x^3}$. 3

SECTION – D

Question numbers 40 to 44 carry 5 marks each.

- 41 AB and CD are respectively the smallest and longest sides of a quadrilateral ABCD. Show that : a) $\angle A > \angle C$ b) $\angle B > \angle D$ 5
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- 42 Prove that the sum of any two sides of a triangle is greater than its third side. 5
- 43 The sides AB and AC of a $\triangle ABC$ are produced to P and Q respectively. If the bisectors of $\angle PBC$ and $\angle QCB$ intersect at O, then prove that $\angle BOC = 90^\circ - \frac{1}{2} \angle A$ 5
- 44 Draw graphs of the equations : $3x - 2y = 4$ and $x + y - 3 = 0$ 5

PROJECT WORK – CLASS : IX

“DESIGN A CROSSWORD PUZZLE WITH MATHEMATICAL TERMS”