DR.MKK ARYA MODEL SCHOOL, MODEL TOWN
HOLIDAYS HOMEWORK, JUNE 2022
CLASS-IX
Subject-Mathematics

Chapter-1 (Number system)

1. If x= 3 +$\sqrt{8}$, then find the value of $x^2 + \frac{1}{x^2}$
2. Simplify : $\frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}}$.
3. Simplify: i) ($\sqrt{5}$ - $\sqrt{2}$) ($\sqrt{2}$ - $\sqrt{3}$) (ii) $\left(\sqrt{5}+\sqrt{2}\right)^2$
4. Add : ($2\sqrt{2}+ 5\sqrt{3}-7\sqrt{5}$) and ($3\sqrt{3}$ - $\sqrt{2}$ + $\sqrt{5}$)
5. Subtract : ($6\sqrt{2}+ 3\sqrt{5}$) from ($3\sqrt{2}$ - $5\sqrt{5}$).
6. Find five rational numbers between i) 3 and 4 ii) $\frac{3}{5}$ and $\frac{4}{7}$
7. Represent : $\sqrt{5}$ and $\sqrt{2}$ on number line.
8. Express in the following in the form of $\frac{p}{q}$: a) $0.4\overline{7}$ b) $0.2\overline{35}$
9. Represent : $\sqrt{9.3}$ and $\sqrt{3.5}$ on number line.
10. Rationalize the denominator: (i) $\frac{5}{\sqrt{3}-\sqrt{5}}$ (ii) $\frac{1}{7+3\sqrt{2}}$
11. Simplify: (i) $\frac{11^{\frac{1}{2}}}{11^{\frac{1}{4}}}$ (ii) $125^{-\frac{1}{3}}$

Chapter-2 (Polynomials)

1. Find the remainder when $x^3 - ax^2 + 6x - a$ is divided by $x - a$
2. Check whether $7 + 3x$ is a factor of $3x^3 + 7x$.
3. Check whether g(x) is a factor of p(x) or not: p(x) = $x^3 - 4x^2 + x + 6$, g(x) = $x - 3$
4. Find the value of k, if $x - 1$ is a factor of p(x)=$kx^2 - \sqrt{2x} + 1$
5. Factorize: $(i)6x^2 + 5x - 6$ $(ii)3x^2 - x - 4$ (iii) $x^2 - 8x - 105$
6. Factorize: $(i)x^3 - 3x^2 - 9x - 5$ $(ii)\ x^3 + 13x^2 + 32x + 20$
7. Expand the following by using suitable identity: (i) $\left(\frac{1}{4}a^2 - \frac{1}{2}b + 1\right)^2$ (ii) $\left(x - \frac{2}{3}y\right)^3$
8. Factorise: (i) $2x^2 + y^2 + 8z^2 - 2\sqrt{2}xy + 4\sqrt{2}yz - 8zx$
   (ii) $27p^3 - \frac{1}{216} - \frac{9}{2}p^2 + \frac{1}{4}p$
   (iii) $64m^3 - 343n^3$
   (iv) $8x^3 + y^3 + 27z^3 - 18xyz$
9. If p(x) = $x^2 - 2\sqrt{2}x + 1$, then find p($2\sqrt{2}$)
10. If $a^2 + b^2 + c^2 = 20\ and\ ab + bc + ca = 8$, then find the value of $a + b + c$.

11. **If $x - y = 6$ and $xy = 10$, then find the value of $x^3 - y^3$**
12. **Simplify: $a + \frac{1}{a} = 7$, then find the value of $a^3 + \frac{1}{a^3}$**

Chapter-3(Coordinate geometry)

1.Without plotting the points indicate the quadrant in which they lie , if:

a. Ordinate is 5 and abscissa is -3.
b. Abscissa is -5 and ordinate is -3.
c. Abscissa is -5 and ordinate is 3.
d. Ordinate is 5 and abscissa is 3.

2. Plot the points A(0,4) , B(-3,0) and C(2,0) on a graph paper .What figure will we get after joining the points.

3. What is the perpendicular distance of (2,-4) from y-axis ?

4. Plot the points P(3,0) , Q(7,9) , R(-6,9) ,S(-2,0). Name the figure PQRS. Find the area of PQRS.

5. Plot the points P(0,1) ,Q(4,0) and S(1,3) ,Find the coordinates of point R such that PQRS is a square.

6. Answer the following :

i) Plot the following points A(-2,3) and B(3,3).

ii) What is the distance of point A from Y-axis ?

iii) What is the distance of point B from x-axis ?

iv)Find the length of AB.

Chapter-12(Heron's formula)

1. **Sides of a triangle are in the ratio of 12:17:25 and its perimeter is 540 cm .Find its area.**
2. **An isosceles triangle has perimeter 30 cm and each of the equal sides is 12 cm . Find the area of the triangle .**
3. **A triangle and a parallelogram have a same base and same area .If the sides of the triangle are 26 cm , 28 cm and 30 cm and the parallelogram stands on the base 28 cm , find the height of the parallelogram.**
4. **Find the area of a quadrilateral ABCD in which AB = 3 cm, BC = 4 cm, CD = 4 cm, DA = 5 cm and AC = 5 cm.**
5. **A kite in the shape of a square with a diagonal 32 cm and an isosceles triangle of base 8 cm and sides 6 cm each is to be made of three different shades as shown in figure. How much paper of each shade has been used in it?**

6. A field is in the shape of a trapezium whose parallel sides are 25 m and 10 m. The non-parallel sides are 14 m and 13 m. Find the area of the field.
7. The area of an equilateral triangle is $16\sqrt{3}$ m^2 .Find its perimeter.
8. The perimeter of an isosceles triangle is 32 m .The ratio of the equal sides to its base is 3:2.Find the area of triangle.
9. Find the cost of laying grass in a triangular field of sides 50 m , 65 m and 65 m at the rate of Rs.7 per m^2.
10. The semi perimeter of an equilateral triangle is 60cm .Find its area.