

Assignment Ch- 12 (Heron's Formula)

Class IX Mathematics

1. The sides of a triangular field are 41 m, 40 m and 9 m. Find the number of rose beds that can be prepared in the field, if each rose bed, on an average needs 900 cm^2 space. (2000)
2. 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 (10500)
3. From a point in the interior of an equilateral triangle, perpendiculars are drawn on the three sides. The lengths of the perpendiculars are 14 cm, 10 cm and 6 cm. Find the area of the triangle. ($300\sqrt{3} \text{ cm}^2$)
4. The perimeter of an isosceles triangle is 32 cm. The ratio of the equal side to its base is 3:2. Find the area of the triangle. ($32\sqrt{2} \text{ cm}^2$)
5. The perimeter of a triangular field is 420 m and its sides are in the 6 : 7 : 8. Find the area of triangular field ($2100\sqrt{15} \text{ m}^2$)
6. The sides of a quadrilateral ABCD are 6 cm, 8 cm, 12 cm and 14 cm respectively, and angle between the first two sides is a right angle. Find its area. ($24\sqrt{6+1} \text{ cm}^2$)
7. A rhombus shaped sheet with perimeter 40 cm and one diagonal 12 cm, is painted on both sides at the rate of Rs 5 per m^2 . Find the cost of painting. (Rs960)
8. If each side of a triangle is doubled, then find the ratio of area of the new triangle thus formed and the given triangle. (4:1)
9. The perimeter of a triangle is 50 cm. One side of a triangle is 4 cm longer than the smaller side and the third side is 6 cm less than twice the smaller side. Find the area of the triangle. ($20\sqrt{30} \text{ cm}^2$)
10. The area of trapezium is 475 cm^2 and the height is 19 cm. Find the length of its two parallel sides if one side is 4 cm greater than the other. (23 cm, 27 cm)
11. A rectangular plot is given for constructing a house, having a measurement of 40 m long and 15 m in the front. According to the laws, a minimum of 3 m, wide space should be left in the front and back each and 2 m wide space on each of other sides. Find the largest area where house can be constructed. (374 cm^2)
12. A field is in the shape of a trapezium having parallel sides 90 m and 30 m. These sides meet the third side at right angles. The length of the fourth side is 100 m. If it costs Rs 4 to plough 1 m^2 of the field, find the total cost of ploughing the field (Rs19200)
13. The dimensions of a rectangle ABCD are 51 cm x 25 cm. A trapezium PQCD with its parallel sides QC and PD in the ratio 9:8 is cut off from the rectangle. If the area of the trapezium PQCD is $\frac{5}{6}$ th part of the area of rectangle, find the lengths of QC and PD. (45 cm, 40 cm)
14. A field in the form of a parallelogram has sides 60 m and 40 m and one of its diagonal is 80 cm long. Find the area of the parallelogram ($600\sqrt{15} \text{ m}^2$)

ASSIGNMENT

Math

Class IX

Chapter-1,2,3

Q-1 Find the following rational numbers as decimals and state that whether they are terminating or non terminating.

(i) $\frac{437}{999}$ (ii) $\frac{327}{500}$ (iii) $\frac{2}{13}$ (iv) $\frac{-2}{15}$ Ans:
(i) $0.\overline{437}$ (ii) 0.654 (iii) $0.\overline{153846}$ (iv) $-0.\overline{13}$

Q-2 Express each of the following in the form $\frac{p}{q}$.

(i) $\overline{0.001}$ (ii) $23.\overline{43}$ (iii) $0.12\overline{3}$ (iv) $125.\overline{3}$ (v) $0.003\overline{52}$ Ans(i)
 $\frac{1}{999}$ (ii) $\frac{2320}{99}$ (iii) $\frac{111}{900}$ (iv) $\frac{376}{3}$ (v) $\frac{349}{99000}$

Q-3 Find two irrational numbers between 0.1 and 0.12.

Q-4 Examine whether the following numbers are rational or irrational.

(i) $2+\sqrt{3}$ (ii) $(\sqrt{2}-2)^2$ (iii) $\sqrt{4}$ (iv) $(2+\sqrt{2})(2-\sqrt{2})$

Q-5 Represent the following on Number Line and write the steps of construction also.

$\sqrt{6}, \sqrt{8}, \sqrt{4.7}, \sqrt{10.5}$

Q-6 Visualise the following on number line by using Successive Magnification.

2.665 , $4.2\overline{7}$ (up to four decimal Places)

Q-7 Evaluate the Following.

(i) $5^8 \div 5^3$ (ii) $\left(\frac{3}{4}\right)^{-3}$ (iii) $2^{55} \times 2^{24} - 2^{12} \times 2^{67}$ (iv) $\left(\frac{64}{25}\right)^{-3/2}$ (v) $(25)^{-1/3} \times \sqrt[3]{16}$ (vi)
 $\left(\frac{\sqrt{2}}{5}\right)^8 \div \left(\frac{\sqrt{2}}{5}\right)^{13}$

Ans: (i) 3125 (ii) $\frac{64}{27}$ (iii) 0 (iv) $\frac{125}{512}$ (v)

$$2\left(\frac{2}{25}\right)^{1/3} \quad \text{(vi)} \quad \frac{3125}{4\sqrt{2}}$$

Q-8 If $27^x = \frac{9}{3^x}$, find x. Ans: $\frac{1}{2}$

Q-9 Find the values of x in following.

(i) $\left(\frac{3}{5}\right)^x \left(\frac{5}{3}\right)^{2x} = \frac{125}{27}$ (ii) $2^{x-7} \times 5^{x-4} = 1250$ (iii) $2^{x-5} \times 5^{x-4} = 5$ (iv) $(2^2)^x = (2^3)^4$ Ans: (i) 3
(ii) 8 (iii) 5 (iv) 6

Q-10 Write the value of (i) $\sqrt[3]{125 \times 27}$ (ii) $\sqrt[3]{7} \times \sqrt[3]{49}$ (iii) $\left(\frac{1}{9}\right)^{-1/2} \times (64)^{-1/3}$ Ans(i)

15 (ii) 7 (iii) $\frac{3}{4}$

Q-11 Rationalise the Following.

(i) $\frac{2\sqrt{7}}{\sqrt{11}}$ (ii) $\frac{7+3\sqrt{5}}{7-3\sqrt{5}}$ (iii) $\frac{\sqrt{2}-1}{\sqrt{5}}$ (iv) $\frac{\sqrt{10}+\sqrt{15}}{\sqrt{2}}$ Ans: (i) $\frac{2\sqrt{77}}{11}$ (ii) $\frac{47+21\sqrt{5}}{2}$ (iii) $\frac{\sqrt{10}-\sqrt{5}}{5}$ (iv) $\frac{2\sqrt{5}+\sqrt{30}}{2}$

Q-12 In each of the following , find the value of a and b.

(i) $\frac{\sqrt{3}-1}{\sqrt{3}+1} = a-b\sqrt{3}$ (ii) $\frac{4+\sqrt{2}}{2+\sqrt{2}} = a - \sqrt{b}$ (iii) $\frac{\sqrt{11}-\sqrt{7}}{\sqrt{11}+\sqrt{7}} = a- b\sqrt{77}$ (iv) $\frac{4+3\sqrt{5}}{4-3\sqrt{5}} = a + b\sqrt{5}$

Ans: (i) a=2, b=1 (ii) a=3, b=2 (iii) a= $\frac{9}{2}$, b= $\frac{1}{2}$ (iv) a= $-\frac{61}{29}$, b= $-\frac{24}{29}$

Q-13 Evaluate each of the Following (i) $185 \times 185 - 115 \times 115$ (ii) $(97)^2$ (iii) $0.54 \times 0.54 -$

0.46×0.46 (iv) 103×10 (v) $(99)^3$

Ans(i)21000 (ii)9409 (iii)

0.08 (iv) 10609 (v)970299

Q-14 Find the Products. (i) $(2x + 3y)(2x-3y)$ (ii) $(x-1)(x+1)(x^2+1)(x^4 + 1)$ (iii) $\left(\frac{x}{2} - \frac{2}{5}\right) \left(\frac{2}{5} - \frac{x}{2}\right)$

$-x^2 + 2x$ (iv) $\left(m + \frac{n}{7}\right)^3 \left(m - \frac{n}{7}\right)$ (v) $(2x+y)(2x-y)(4x^2 + y^2)$ Ans: (i) $4x^2-9y^2$ (ii) x^8-1

(iii) $-\frac{5}{4}x^2 + \frac{12}{5}x - \frac{4}{5}$ (iv) $\left(m + \frac{n}{7}\right)^2 \left(m^2 - \frac{n^2}{49}\right)$ (v) $16x^4-y^4$

Q-15 Write the following in expanded form. (i) $(-x + 2y + z)^2$ (ii) $(ab + bc + ca)^2$ (iii)

$\left(\frac{x}{y} + \frac{y}{z} + \frac{z}{x}\right)^2$ (iv) $(a^2b - b^2a)^2$ Ans: (i) $x^2 + 4y^2 + 9z^2 - 4xy + 12yz - 6zx$ (ii) $a^2b^2 + b^2c^2 +$

$c^2a^2 + 2a^2bc + 2ab^2c + 2abc^2$ (iii) $\frac{x^2}{y^2} + \frac{y^2}{z^2} + \frac{z^2}{x^2} + 2\frac{x}{z} + 2\frac{y}{x} + 2\frac{z}{y}$ (iv) $a^4b^2 - 2a^3b^3 + b^4a^2$

Q-16 Simplify (i) $(a + b + c)^2 - (a - b - c)^2$ (ii) $\left(\frac{x}{2} + \frac{y}{3}\right)^3 - \left(\frac{x}{2} - \frac{y}{3}\right)^3$ (iii) $(6m - n)(36m^2 + 6mn + n^2) - (3m + 2n)^3$

(iv) $(1 - x)(1 + x + x^2)$ Ans: (i) $2(a^2 + b^2 + c^2 + 2bc)$ (ii) $\frac{2y^3}{27} + \frac{x^2y}{2}$ (iii) $189m^3 - 9n^3 - 54m^2n - 36mn^2$ (iv) $1 - x^3$

Q-17 Find the following products: (i) $(3x - 4y + 5z)(9x^2 + 16y^2 + 25z^2 + 12xy - 15zx + 20yz)$ (ii) $(2a - 3b - 2c)(9x^2 + 16y^2 + 25z^2 + 12xy - 15zx + 20yz)$ (iii) $(7a - 5b)(49a^2 + 35ab + 25b^2)$ (iv)

$\left(\frac{5}{x} + 5x\right)\left(\frac{25}{x^2} - 25 + 25x^2\right)$ Ans: (i) $27x^3 - 64y^3 + 125z^3 + 180xyz$ (ii) $8a^3 - 27b^3 - 8c^3 -$

$36abc$ (iii) $343a^3 - 125b^3$ (iv) $\frac{125}{x^3} + 125x^3$

Q-18 Factorize: (i) $21x^2 - 2x + \frac{1}{21}$ (ii) $x^2 + 6\sqrt{2}x + 10$ (iii) $x^3 + x - 3x^2 - 3$ (iv) $x^6 + y^6$ (v) $1 - 27a^3$ (vi) $8x^3 + y^3 + 12x^2y + 6xy^2$ (vii) $x^3 + 8y^3 + 64z^3 - 24xyz$ (viii) $x^3 + 6x^2 + 11x + 6$ (ix) $x^3 - 6x^2 + 3x + 10$ (x) $2y^3 - 5y^2 - 19y + 42$ Ans: (i) $\left(\sqrt{21}x - \frac{1}{\sqrt{21}}\right)^2$ (ii) $(x + 5\sqrt{2})(x + \sqrt{2})$

(iii) $(x-3)(x^2 + 1)$ (iv) $(x^2 + y^2)(x^4 - x^2y^2 + y^4)$ (v) $(1-3a)(1+3a+9a^2)$ (vi) $(2a+b)^3$

(vii) $(x+2y+3z)(x^2 + 4y^2 + 16z^2 - 2xy - 8yz - 4zx)$ (viii) $(x+1)(x+2)(x+3)$ (ix) $(x+1)(x-2)(x-5)$ (x) $(y-2)(y+3)(2y-7)$

Q-19 If $x=2$ and $x=0$ are zeroes of polynomial $f(x) = 2x^3 - 5x^2 + ax + b$. Find the value of a and b. Ans : $a=2, b=0$

Q-20 Using Remainder theorem find the remainder when $f(x)$ is divided by $g(x)$.

(i) $F(x) = 4x^3 - 12x^2 + 14x - 3, g(x) = x - \frac{1}{2}$ (ii) $f(x) = x^3 - 6x^2 + 2x - 4, g(x) = 1 - 3x$

Ans: (i) $\frac{3}{2}$ (ii) $-\frac{107}{27}$

Q-21 If the polynomials $ax^3 + 4x^2 + 3x - 4$ and $x^3 - 4x + a$ leave the same remainder when divided by $(x-3)$, find the value of a. Ans: $a=-1$

Q-22 Show that $x + 1$ and $2x - 3$ are factors of $2x^3 - 9x^2 + x + 12$, without actual division.

Q-23 Find the value of a such that $(x - 4)$ is a factor of $5x^3 - 7x^2 - ax - 28$. Ans: 45

Q-24 Plot all points on graph paper by taking suitable scale on axes.

$(24, -\frac{7}{2})$; $(-18, 14)$; $(-12, -\frac{21}{2})$; $(30, 7)$; $(\frac{15}{2}, -21)$

Q-25 Plot the points on Graph paper and also tell that to which quadrant these points belong.

$(2, 5)$; $(4, -3)$; $(-5, -7)$; $(7, -4)$; $(7, 0)$; $(-4, 0)$; $(0, 0)$; $(0, -4)$; $(0, 7)$.