

b. Find the value of 102×98 (without actual multiplication)

Ans: $(100+2)(100-2)=1000-4=9996$

c. Factorize $(x+3)x + (x+3)y$

Ans: $(x+3)(x+y)$

d. Find the sum of interior angles of a 7 sided polygon.

Ans: $(2n-4) \times 90^\circ = (2 \times 7-4) \times 90^\circ = 900^\circ$

e. Write the coordinate of point P(4,6) when reflected in X axis.

Ans:(4-6)

5. Answer any five questions:

3 x 5 = 15

a. Find the value of $a^2 + b^2$ when $a - b = 7$ and $ab = 18$.

Ans: $a^2+b^2=(a-b)^2+2ab = (7)^2 + 2.18 = 49+36=85$

b. Factorize $4x^4 - 12x^2 + 9$

Ans: $(2x^2)^2 - 2.2x.3 + (3)^2 = (2x^2 - 3)^2 = (2x^2 - 3)(2x^2 - 3)$

c. Solve: $3(x+1) + 4x = 24$.

Ans: $3(x+1) + 4x = 24$.

or, $7x = 21$ or, $x=3$

d. Find the four angles of a quadrilateral if they are in the ratio 3:5 : 7 :9 .

Ans: Let the angles be $3x, 5x, 7x$ and $9x$. Therefore, $3x+5x+7x+9x = 360^\circ$

or, $24x = 360^\circ$ or, $x=15^\circ$.

Hence the angles are : $45^\circ, 75^\circ, 105^\circ, 135^\circ$.

e. Write the properties of a rhombus.

Ans: i.All sides are equal.

ii. Opposite angles are equal.

iii. The diagonals bisect the interior angles.

iv. The diagonals bisect each other at right angles.

f. Find the number of sides of a polygon, the sum of whose interior angle is 1440° .

Ans: Sum of the interior angles: $(2n - 4) \times 90^\circ = 1440^\circ$ or, $2n = 1440^\circ/90^\circ + 4 = 20$

or, $n = 10$.

Hence number of sides is 10.

g. What is the rotational symmetry and order of rotational symmetry?

Ans: A figure is said to have a rotational symmetry if it fits onto itself more than one in one complete rotation. The number of times a figure fits into itself in one complete rotation is called order of rotational symmetry.

GROUP C

Q6. Answer the following questions(any nine)

5X9

i. Factorise: $x^2 + 16x - 225$

Ans: $x^2 + 25x - 9x - 225 = (x + 25)(x - 9)$.

ii. Factorise: $6x^3 - 7x^2 - 5x$

Ans: $x(6x^2 - 7x - 5) = x(6x^2 - 10x + 3x - 5) = x(2x + 1)(3x - 5)$

iii. Naresh can finish a work in 18 hours while Anuj can complete the same work in 24 hours. How long will it take them together to complete the work if Naresh is called away for 2 hours while Anuj continues with the work ?

Ans: Let Anuj does the work for x hours and naresh does the work for $(x-2)$ hours.

Therefore in 1 hour by both together work done = $\frac{x-2}{18} + \frac{x}{24}$

So, whole work = $\frac{x-2}{18} + \frac{x}{24} = 1$

Or, $x = \frac{80}{7} = 11\frac{3}{7}$ hours

iv. solve $\frac{(x-4)(3x+2)-3x^2+4}{x-3} = 2$

Ans: $3x^2 - 10x - 8 - 3x^2 + 4 = 2x - 6,$

or, $12x = 2, \text{ or, } x = \frac{1}{6}.$

v. Four years ago, the ratio of the ages of A and B was 2:3 and after 4 years it becomes 5:7. Find their present ages.

Ans: Let the present ages of A and B are x years and y years respectively. So according to the question $3(x-4) = 2(y-4)$ (i)

and $7(x+4) = 5(y+4)$ (ii)

solving $x = 36$ years and $y = 52$ years.

vi. Prove that the diagonal BD of kite ABCD bisect the interior angles $\angle B$ and $\angle D$.

Ans: In triangles ABD and CBD, $AB=BC, AD = CD, BD=BD$

Therefore those are congruent. So, diagonal BD bisect $\angle ABC$ and $\angle ADC$

vii. Prove that the sum of the interior angles of an octagon is twice the sum of the interior angles of a pentagon.

Ans: For the octagon, total internal angle = $(2 \times 8 - 4) \times 90^0 = 12 \times 90^0$

For the pentagon, total internal angle = $(2 \times 5 - 4) \times 90^0 = 6 \times 90^0$

Hence it is clear from the above two equation that –

Interior angles of an octagon is twice the sum of the interior angles of a pentagon.

viii. Construct the quadrilateral ABCD in which $AB = 4\text{cm}, BC = 6\text{cm}, CD = 5.5 \text{ cm}, AD = 5\text{cm}$ and $AC = 8\text{cm}$.

Ans: first draw the lines using scale and then using compass form the quadrilateral.

ix. Plot the points $(2,1), (-1,3), (-3, 0), (0, -2)$ on a graph and join them. What is the name of the figure?

Ans: Using a graph paper, after plotting the points and then joining them, you will get a quadrilateral.

x. The digits of a two-digit number are in the ratio 2:3 and the number obtained by interchanging is greater than the original number by 27. What is the original number?

Let the two digit number be $10x + y.$

According to the question $3x = 2y$ (i) and

$10y + x = 10x + y + 27$(ii)

Solving $x = 6$ and $y = 9$. So the number is 69.