Test-5

1. Solve for x and y :-

(i) $x - 3y - 3 = 0$
$3x - 9y - 2 = 0$

(ii) $2x + y = 5$
$3x + 2y = 8$

(iii) $3x - 5y = 20$
$6x - 10y = 40$

(iv) $x - 3y - 7 = 0$
$3x - 3y - 15 = 0$

[Use either Substitution method or Elimination method]

2. $\alpha^2 + \beta^2 =$

3. $\alpha^3 + \beta^3 =$

4. $\alpha^4 + \beta^4 =$ ______________ = ______________

5. State fundamental theorem of Arithmetic.

6 - RATIOS	GRAPHICAL REPRESENTATION	AL RAIC INTERPRETATION	CONSISTENCY
1)			
2)			
3)			

Test-5 (Answers)

1) (i) $x - 3y = 3 \rightarrow (1)$

$3x - 9y = 2 \rightarrow (2)$

$(1) \times 3 \Rightarrow \cancel{3x} - \cancel{9y} = 9$

$(2) \Rightarrow \overset{(-)}{\cancel{3x}} \overset{(+)}{-} \cancel{9y} \overset{(-)}{=} 2$

$(-), \quad 0 = 7$, which is a false statement.

Hence, the given pair of equations have no solution.

(ii) $2x + y = 5 \rightarrow (1)$

$3x + 2y = 8 \rightarrow (2)$

From eq: (1), $y = 5 - 2x \rightarrow (3)$

On Substituting eq: (3) in eq: (2), $3x + 2(5-2x) = 8$

$3x + 10 - 4x = 8$

$-x = 8 - 10$

$-x = -2$

$\boxed{x = 2}$

From eq: (3), $y = 5 - 4$

$\boxed{y = 1}$

(iii) $3x - 5y = 20 \rightarrow (1)$

$6x - 10y = 40 \rightarrow (2)$

$(1) \times 2 \Rightarrow \cancel{6x} - \cancel{10y} = \cancel{40}$

$(2) \Rightarrow \overset{(-)}{\cancel{6x}} \overset{(+)}{-} \cancel{10y} \overset{(-)}{=} \cancel{40}$

$(-) \quad 0 = 0$, which is a true statement

Hence, the given pair of equations have infinitely many solutions.

(iv) $x - 3y = 7 \rightarrow (1)$

$\overset{(-)}{3x} \overset{(+)}{-} \cancel{3y} \overset{(-)}{=} 15 \rightarrow (2)$

$(1) - (2), \quad -2x = -8$

$\boxed{x = 4}$

From eq: (1), $4 - 3y = 7$

$-3y = 3$

$\boxed{y = -1}$

2) $\alpha^2 + \beta^2 = (\alpha + \beta)^2 - 2\alpha\beta$

3) $\alpha^3 + \beta^3 = (\alpha + \beta)^3 - 3\alpha\beta(\alpha + \beta)$

4) $\alpha^4 + \beta^4 = (\alpha^2)^2 + (\beta^2)^2 = (\alpha^2 + \beta^2)^2 - 2\alpha^2\beta^2$

$= [(\alpha + \beta)^2 - 2\alpha\beta]^2 - 2\alpha^2\beta^2$

5) The fundamental theorem of Arithmetic States that every composite number can be expressed as the product of its prime factors and this factorisation is unique apart from the order in which the prime factors occur.

6	(i)	$\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$	Intersecting lines	Unique solution	Consistent
	(ii)	$\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$	Coincident lines	Infinitely many solutions	Consistent (dependent)
	(iii)	$\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$	parallel lines	No solution	inconsistent