

Class 11
15-5-2015

First Unit Test in MATHEMATICS

Time : 1 hr.
M. Marks : 20

GENERAL INSTRUCTIONS:

1. Attempt all the questions
2. Section - A consists of 4 questions of 1 mark each.
3. Section - B consists of 5 questions of 2 marks each.
4. Section - C consists of 2 questions of 3 marks each.

SECTION - A

1. If $p(n)$ is the statement $n(n+1)(n+2)$ is divisible by 6, then what is $P(3)$?
2. If $p(n)$ is the statement 7 divides $2^{3n} - 1$ then what is $P(n+1)$?
3. Find the solution set for $-12x > 50$, when $x \in \mathbb{N}$.
4. Solve $\frac{5x}{4} - \frac{3x}{8} > \frac{39}{8}$, when $x \in \mathbb{R}$.

SECTION - B

5. Solve the linear inequality $\frac{x+3}{x-2} \leq 2$, $\forall x \in \mathbb{R}$.
6. Find the solution set for the linear equation $\frac{5x-2}{3} - \frac{7x-3}{5} > \frac{x}{4}$, $\forall x \in \mathbb{R}$.
7. Prove the following using principle of mathematical induction:
$$\frac{1}{2.5} + \frac{1}{5.8} + \frac{1}{8.11} + \dots + \frac{1}{(3n-1)(3n+2)} = \frac{n}{6n+4}$$
 is true for all natural numbers.
8. Using principle of mathematical induction prove that $41^n - 14^n$ is divisible by 27.
9. Solve the given system of linear inequations and represent the solution in number line. $5(2x - 7) - 3(2x + 3) \leq 0$, $2x + 19 \leq 6x + 47$.

SECTION - C

10. Using principle of mathematical induction prove that:
$$1 + 2 + 3 + \dots + n < \frac{(2n-1)^2}{8} \quad \forall n \in \mathbb{N}$$
11. Solve the following system of linear inequations graphically.
 $X + y \leq 8$, $x - y < 0$, $x \geq 0$, $y \geq 0$.