



# St. Xavier's Sr. Sec. School

Delhi-54

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.  
 $X + y \leq 8$ ,  $x - y < 0$ ,  $x \geq 0$ ,  $y \geq 0$ .



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-X-X-X-X-X-