# SWOT INSTITUTE
# RELATIONS AND FUNCTIONS
# XI-TEST

**Time : 1 hr.**

1. If $\left(\dfrac{x}{3}+1, y-\dfrac{2}{3}\right) = \left(\dfrac{5}{3}, \dfrac{1}{3}\right)$, find the value of x and y.

2. If A = {−1, 1}, find A × A × A.

3. Let A = {1, 2} and B = {3, 4}. Write A × B. How many subsets will A × B have ? List them.

4. Let A = {1, 2, 3, …, 14}. Define a relation R from A to A by R = {(x, y) : 3x − y = 0, where x, y ∈ A}. Write down is domain, codomain and range.

5. Determine the domain and range of the relation R defined by R = {(x, x + 5) : x ∈ {0, 1, 2, 3, 4, 5]}.

6. Find the domain and range of the following real functions :

    $f(x) = \sqrt{9 - x^2}$

7. The function 't' which maps temperature in degree Celcius into temperature in degree Fahreheit is defined by $n(C) = \dfrac{9C}{5} + 32$. Find :

    (i) t(0)    (ii) t(28)        (iii) t(−10)        (iv) The value of C, when t(C) = 212.

8. Find the domain of the function $f(x) = \dfrac{x^2 + 3x + 5}{x^2 - 5x + 4}$.

9. If $f(x) = x^2$, find $\dfrac{f(1.1) - f(1)}{(1.1 - 1)}$

10. Find the domain of the function $f(x) = \dfrac{x^2 + 2x + 1}{x^2 - 8x + 12}$.

11. Let f = $\left\{\left(x, \dfrac{x^2}{1 + x^2}\right) : x \in R\right\}$ be a function from R into R. Determine the range of f.

12. Let f, g : R → R be defined, respectively by f(x) = x + 1, g(x) = 2x − 3. Find f + g, f − g and $\dfrac{f}{g}$.