Sets,Relations and functions

1. If $A = [(x, y) : x^2 + y^2 = 25]$ and $B = [(x, y) : x^2 + 9y^2 = 144]$, then $A \cap B$ contains —— points.

2. In a college of 300 students, every student reads 5 newspapers, and every newspaper is read by 60 students. The number of newspapers is ——

3. Let R be the relation on the set R of all real numbers defined by aRb if and only if $|a - b| \leq 1$. Then R is

   (a) Reflexive Symmetric and Transitive

   (b) Not Reflexive But Symmetric and Transitive

   (c) Reflexive and Symmetric but not Transitive

4. if $f(x) = \frac{x-3}{x+1}$ then $f(f(f(x)))$ is

   (a) $\frac{1}{x}$

   (b) $3x$

   (c) x

   (d) $\frac{1+x}{x}$

5. If $f(x) = 3x - 5$, then $f^{-1}(x)$ is?

6. $f(x) = sin^{-1}(4 - (x - 7)^3)^{\frac{1}{7}}$ then $f^{-1}(x) = $——?

7. If $f : R \rightarrow R$, $f(x) = x^2 + 1$ then $f^{-1}(2) \cup f^{-1}(17) = $——?

8. If function f satisfies the equation $3f(x) + 2f(\frac{x+59}{x-1}) = 10x + 30, x \neq 1$ then $f(7) = $——?

9. $g : R \rightarrow R$, $g(x) = 3 + \sqrt[3]{x}$ and $f(g(x)) = 2 - \sqrt[3]{x} + x$ then $f(x) = $——?

10. The domain of the function $f(x) = \frac{1}{\sqrt{|x|-x}}$ is

    (a) $(-\infty, \infty)$

    (b) $(0, \infty)$

    (c) $(-\infty, 0)$

    (d) $(-\infty, \infty) - \{0\}$