

## Practice Questions

Q1: Write the set  $B = \{x : x \in \mathbb{Z} : x^2 \leq 25\}$  in tabular form, where  $\mathbb{Z}$  is the set of integers.

Q2: List the elements of set  $A$ , where  $A =$  Set of any three irrational numbers.

Q3: List the elements of the following set, where  $\mathbb{Z}$  is the set of integers  
 $\{x : x \in \mathbb{Z} \text{ and } x^2 + 1 = 26\}$

Q4: Write the set  $A = \{8, 9, 10, 11, 12, 13, 14, 15\}$  in set builder form.

Q5: Write all proper subsets of  $A = \{2, 5, 11\}$ .

Q6: Let  $A = \{x \in \mathbb{Z}^+ \mid x \text{ is divisible by 2 but less than 30}\}$  and  $B = \{y \in \mathbb{Z}^+ \mid y \text{ is divisible by 3 but less than 20}\}$  then prove that  $A \cap B = B \cap A$ .

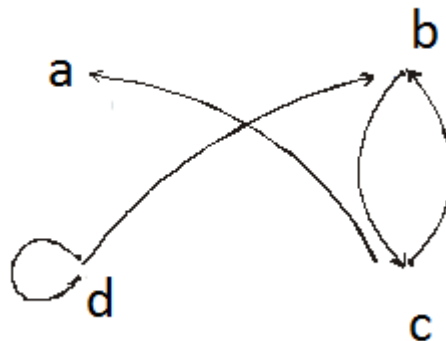
Q7: Find  $x$  and  $y$ , where  $(x + 2y, 3x) = (3, 12)$ .

Q8: For the relation matrix.  $M = \begin{matrix} & \begin{matrix} a & b & c \end{matrix} \\ \begin{matrix} 1 \\ 2 \\ 3 \end{matrix} & \begin{bmatrix} 0 & 1 & 1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{bmatrix} \end{matrix}$  List the set of ordered pairs

represented by  $M$ .

Q9: Let  $A = \{1, 2, 3, 4, 5\}$  Determine the relation  $R$  such that  $xRy$  iff  $x < y$ . Also find the domain and range of the relation.

Q10: Find the relation  $R$  of the given directed graph.



**Q11:** Let  $R$  be the relation on the set of integers  $Z$  defined as

$\forall a, b \in Z, (a, b) \in R \Leftrightarrow a < b$  Is  $R$  reflexive?

**Q12:** Use a Venn diagram to represent the following:  $(A \cup B) \cap C^c$  when  $A$ ,  $B$  and  $C$  are overlapping.

**Q13:** Let  $A \times A = \{(1,1), (1,2), (2,1), (2,2)\}$  Determine the relation  $R$  such that  
 $x R y$  iff  $x < y$

**Q14:** Let  $f : R \rightarrow R$  defined as  $f(x) = 3x^3$ . Show that the given function is well defined.

**Q15:** Let  $f: R \rightarrow R$  be defined by  $f(x) = 4x - 7$ . Show that  $f$  is one-to-one function.