

1. Let $f = \{(1, 1), (2, 3), (0, -1), (-1, -3)\}$ be a function from Z to Z defined by $f(x) = ax + b$, for some integers a, b . Determine a and b .

2. Find the domain of the function

$$f(x) = \frac{x^2 + 2x + 1}{x^2 - 8x + 12}$$

3. Find range of the function $f(x) = -|x|$.

4. Let f be the subset of $Q \times Z$ defined by $f = \left\{ \left(\frac{m}{n}, m \right) : m, n \in Z, n \neq 0 \right\}$. Is f a function from Q to Z ? Justify your answer.

5. Find the domain and the range of the following functions :

(a) $f(x) = \sqrt{x^2 - 4}$

(b) $f(x) = \sqrt{16 - x^2}$

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