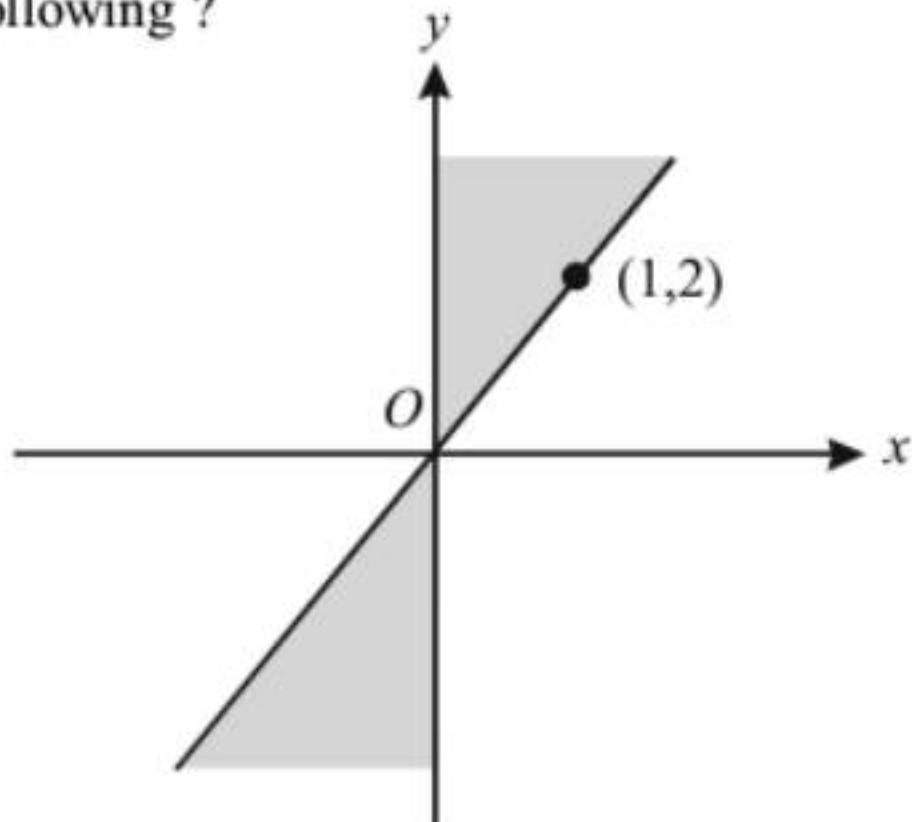


# Practice Exercise

## Level - I

- If  $0 < x < 5$  and  $1 < y < 2$ , then which of the following is true?
  - $x + y < 0$
  - $-3 < 2x - 3y < 4$
  - $-6 < 2x - 3y < 7$
  - $-3 < 3x - y < 2$
- Which of the following is the solution set of  $|2x - 3| < 7$ ?
  - $\{x : -5 < x < 2\}$
  - $\{x : -5 < x < 5\}$
  - $\{x : -2 < x < 5\}$
  - $\{x : x < -5 \text{ or } x > 2\}$
- $|x^2 - 4x| < 5$ 
  - $-1 \leq x \leq 5$
  - $1 \leq x \leq 5$
  - $-1 \leq x \leq 1$
  - $-1 < x < 5$
- If  $1 \leq x \leq 3$  and  $2 \leq y \leq 4$ , what is the maximum value of  $\left(\frac{x}{y}\right)$ ?
  - $\frac{2}{3}$
  - 4
  - $\frac{3}{2}$
  - 2
- The solution set of  $\frac{1}{4} + \frac{1}{x} < \frac{1}{2} + \frac{1}{3}$ , when  $x \in R$ , is:
  - $\frac{1}{x} < \frac{7}{12}$
  - $x \geq \frac{12}{7}$
  - $x < \frac{14}{7}$
  - $\frac{1}{x} > \frac{3}{2}$
- $x > 2, y > -1$ , then which of the following holds good?
  - $xy > -2$
  - $xy < -2$
  - $x > -\frac{2}{y}$
  - None of these
- If  $x > 5$  and  $y < -1$ , then which of the following statements is true?
  - $(x + 4y) > 1$
  - $x > -4y$
  - $-4x < 5y$
  - None of these
- If  $a$  and  $b$  are negative, and  $c$  is positive, which of the following statements is/are true?
  - $a - b < a - c$
  - if  $a < b$ , then  $\frac{a}{c} < \frac{b}{c}$
  - $\frac{1}{b} < \frac{1}{c}$
  - I only
  - II only
  - III only
  - II and III only
- If  $x + y > 5$  and  $x - y > 3$ , then which of the following gives all possible values of  $x$ ?
  - $x > 3$
  - $x > 4$
  - $x > 5$
  - $x < 5$

## Level - II

- If  $x \in R$ , and  $\alpha = \frac{x^2}{(1+x^4)}$ , then
  - $0 \leq \alpha \leq 2$
  - $0 \leq \alpha \leq 1$
  - $0 \leq \alpha \leq \frac{1}{4}$
  - $0 \leq \alpha \leq \frac{1}{2}$
- If  $6 \geq x \geq -2$  and  $4 \geq y \geq -4$ , find the limits for  $\frac{y}{x}$ , where  $x$  and  $y$  are non-zero integers.
  - $\frac{y}{x} \geq 2, \frac{y}{x} \leq \frac{2}{3}$
  - $\frac{y}{x} \geq \frac{-2}{3}, \frac{y}{x} \leq 2$
  - $\frac{y}{x} \geq \frac{-2}{3}, \frac{y}{x} \leq \frac{1}{4}$
  - $\frac{y}{x} \geq -4, \frac{y}{x} \leq 4$
- The shaded portion of figure shows the graph of which of the following?
 
  - $x(y - 2x) \geq 0$
  - $x(y - 2x) \leq 0$
  - $x\left(y + \frac{1}{2}x\right) \geq 0$
  - $x\left(y - \frac{1}{2}x\right) \leq 0$

4. For the real numbers  $p, q, r, x, y$ , let  $p < x < q$  and  $p < y < r$ . Which one of the following is correct?
- (a)  $p < x < y < r$                       (b)  $p < x < q < r$   
 (c)  $p < y < x < q$                       (d) None of these
5. Given that  $-1 \leq v \leq 1$ ,  $-2 \leq u \leq -0.5$  and  $-2 \leq z \leq -0.5$  and  $w = \frac{vz}{u}$ , then which of the following is necessarily true?
- (a)  $-0.5 \leq w \leq 2$                       (b)  $-4 \leq w \leq 4$   
 (c)  $-4 \leq w \leq 2$                       (d)  $-2 \leq w \leq -0.5$
6. If  $|b| \geq 1$  and  $x = -|a|b$ , then which one of the following is necessarily true?
- (a)  $a - xb < 0$                       (b)  $a - xb \geq 0$   
 (c)  $a - xb > 0$                       (d)  $a - xb \leq 0$
7. The number of solutions of the equation  $2x + y = 40$  where both  $x$  and  $y$  are positive integers and  $x \leq y$
- (a) 7    (b) 13  
 (c) 14    (d) 18
8. If  $a, b$  and  $c$  are three real numbers, then which of the following is NOT true?
- (a)  $|a + b| \leq |a| + |b|$   
 (b)  $|a - b| \leq |a| + |b|$   
 (c)  $|a - b| \leq |a| - |b|$   
 (d)  $|a - c| \leq |a - b| + |b - c|$
9.  $x$  and  $y$  are real numbers satisfying the conditions  $2 < x < 3$  and  $-8 < y < -7$ . Which of the following expressions will have the least value?
- (a)  $x^2y$     (b)  $xy^2$   
 (c)  $5xy$     (d) None of these