NDA 1 2025

LIVE

MATHS

INEQUALITIES

CLASS 2

NAVJYOTI SIR

Crack
EXAMS

27 Sep 2024 Live Classes Schedule

8:00AM	27 SEP 2024 DAILY CURRENT AFFAIRS	RUBY MA'AM
9:00AM	27 SEP 2024 DAILY DEFENCE UPDATES	DIVYANSHU SIR

NDA 1 2025 LIVE CLASSES

11:30AM	GK - OCEANOGRAPHY	RUBY MA'AM
1:00PM	BIOLOGY - HUMAN BODY - CLASS 4	SHIVANGI MA'AM
4:00PM	MATHS - INEQUALITIES - CLASS 2	NAVJYOTI SIR
5:30PM	ENGLISH - PARTS OF SPEECH - CLASS 3	ANURADHA MA'AM

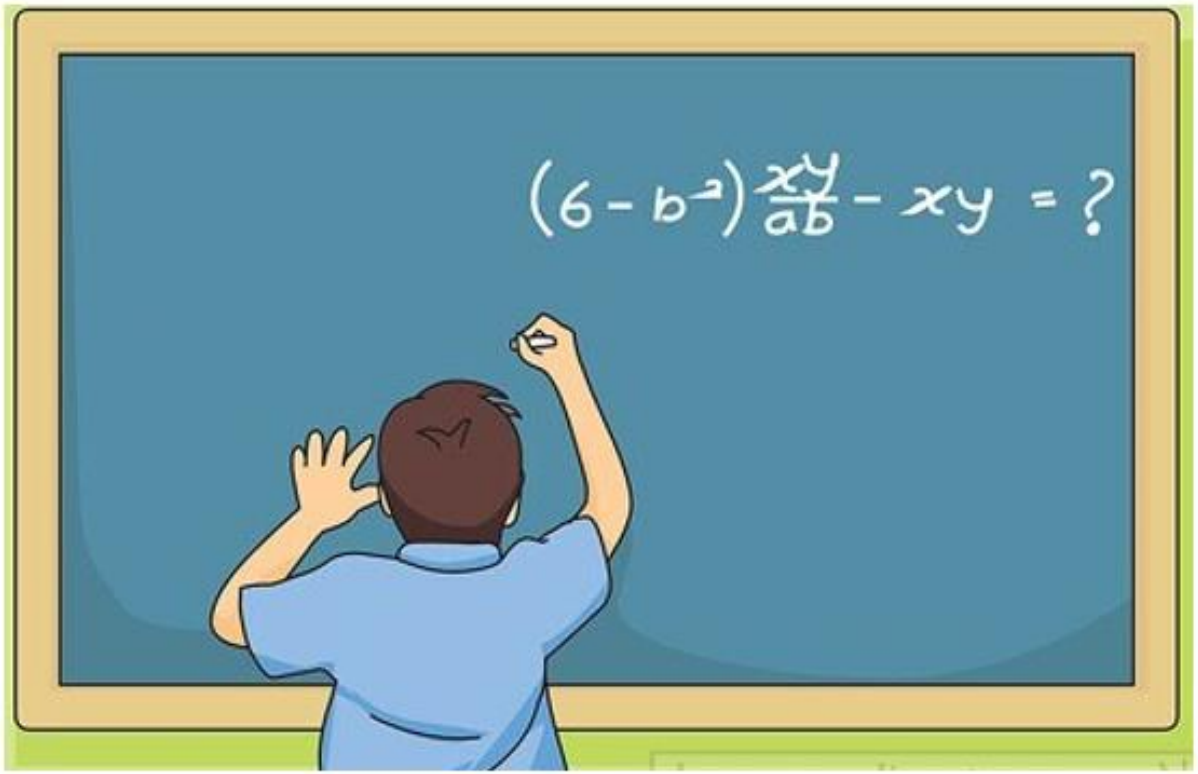
CDS 1 2025 LIVE CLASSES

11:30AM	GK - OCEANOGRAPHY	RUBY MA'AM
1:00PM	BIOLOGY - HUMAN BODY - CLASS 4	SHIVANGI MA'AM
2:30PM	MATHS - INEQUALITIES - CLASS 2	NAVJYOTI SIR
5:30PM	ENGLISH - PARTS OF SPEECH - CLASS 3	ANURADHA MA'AM

AFCAT 1 2025 LIVE CLASSES

10:00AM	REASONING - FIGURE ANALOGY	RUBY MA'AM
2:30PM	MATHS - PROFIT & LOSS - CLASS 2	NAVJYOTI SIR
4:00PM	STATIC GK - MAJOR DEFENCE EQUIPMENT & DEALS	DIVYANSHU SIR
5:30PM	ENGLISH - PARTS OF SPEECH - CLASS 3	ANURADHA MA'AM

PRACTISE
TIME !



QUESTION

The set of real x satisfying the inequality $\frac{5-2x}{3} \leq \frac{x}{6} - 5$ is

$[a, \infty)$. The value of 'a' is

(a) 2 (b) 4

(c) 6 (d) 8

$\frac{5-2x}{3} \leq \frac{x}{6} - 5$

$\frac{5-2x}{3_1} \leq \frac{x-30}{6_2}$

$2(5-2x) \leq x-30$

$10-4x \leq x-30$

$40 \leq 5x$

$8 \leq x$

$[8, \infty)$ $[a, \infty)$

$a = 8$

QUESTION

The set of real x satisfying the inequality $\frac{5-2x}{3} \leq \frac{x}{6} - 5$ is $[a, \infty)$. The value of 'a' is

(a) 2 (b) 4

(c) 6 (d) 8

ANSWER : (d)

QUESTION

If $1.5 \le x \le 4.5$, then which one of the following is correct?

[NDA/NA 2020-I]

(a) $(2x-3)(2x-9) > 0$ (b) $(2x-3)(2x-9) < 0$

(c) $(2x-3)(2x-9) \ge 0$ (d) $(2x-3)(2x-9) \le 0$

$1.5 \le x \le 4.5$

$\frac{3}{2} \le x \le \frac{9}{2}$

$\frac{3}{2} \le x$ ① | $x \le \frac{9}{2}$ ②

① $\frac{3}{2} \le x$

$3 \le 2x$

$2x \ge 3$

$2x - 3 \ge 0$ (+ve)

② $x \le \frac{9}{2}$

$2x \le 9$

$2x - 9 \le 0$ (−ve)

product = −ve

$(2x-3)(2x-9) \le 0$ ✓

QUESTION

If $1.5 \le x \le 4.5$, then which one of the following is correct?

[NDA/NA 2020-I]

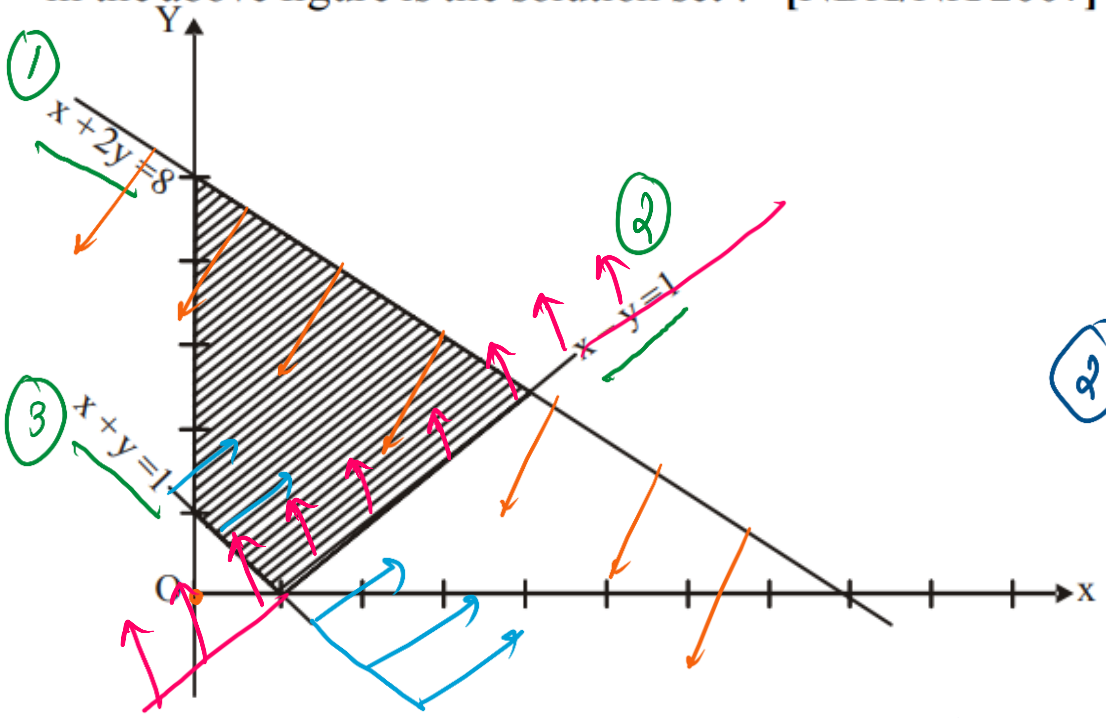
(a) $(2x-3)(2x-9) > 0$ (b) $(2x-3)(2x-9) < 0$

(c) $(2x-3)(2x-9) \ge 0$ (d) $(2x-3)(2x-9) \le 0$

ANSWER : (d)

QUESTION

What are the linear constraints for which the shaded area in the above figure is the solution set ? **[NDA/NA 2007]**



(a) $x-y\geq 1;\ x+2y\leq 8;\ x+y\geq 1;\ x,y\geq 0$ ✓ X

(b) $x-y\leq 1;\ x+2y\geq 8;\ x+y\leq 1;\ x,y\geq 0$ ✓ X

(c) $x-y\leq 1;\ x+2y\leq 8;\ x+y\geq 1;\ x,y\geq 0$ ✓ ✓

(d) $x-y\leq 1;\ x+2y\leq 8;\ x+y\leq 1;\ x,y\geq 0$

① $x+2y=8$

(checking for origin point (0,0))

$0+2(0)\ \ 8$

$0\leq 8$ | $x+2y\leq 8$

② $x-y=1$

$0-0\ \ 1$

$0\leq 1$ | $x-y\leq 1$

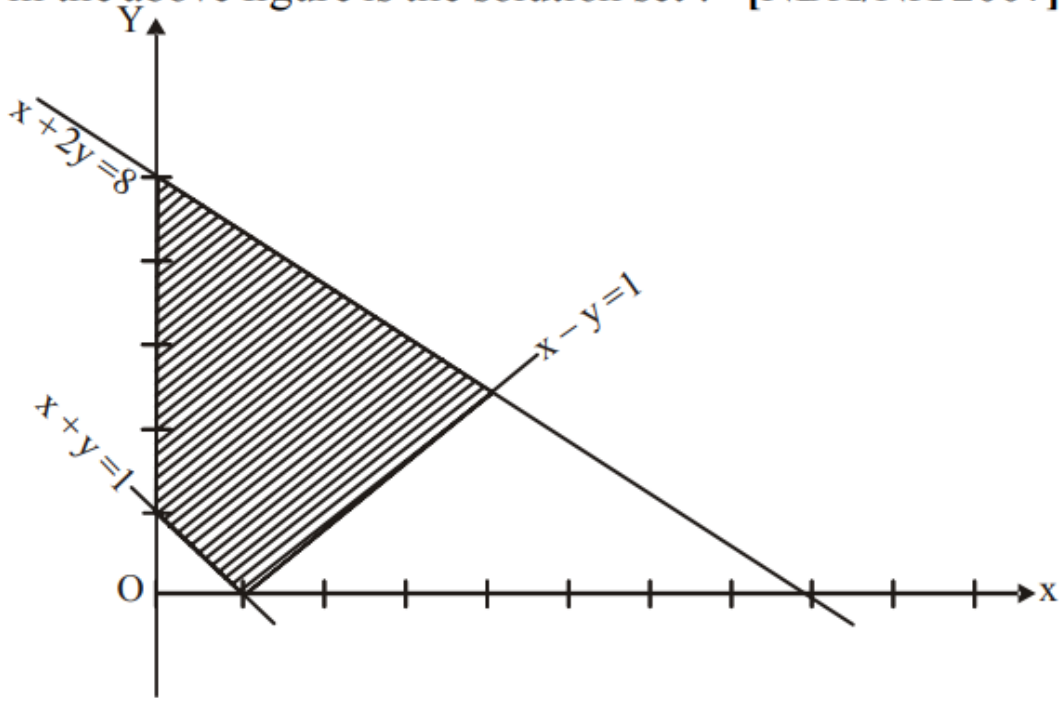
③ $x+y=1$

(origin should not satisfy)

$0+0 \longrightarrow 0\geq 1$ | $x+y\geq 1$

QUESTION

What are the linear constraints for which the shaded area in the above figure is the solution set ? **[NDA/NA 2007]**



(a) $x - y \geq 1;\ x + 2y \leq 8;\ x + y \geq 1;\ x, y \geq 0$

(b) $x - y \leq 1;\ x + 2y \geq 8;\ x + y \leq 1;\ x, y \geq 0$

(c) $x - y \leq 1;\ x + 2y \leq 8;\ x + y \geq 1;\ x, y \geq 0$

(d) $x - y \leq 1;\ x + 2y \leq 8;\ x + y \leq 1;\ x, y \geq 0$

ANSWER : (c)

QUESTION

The solution set of the inequality $5^{x+2} > \left(\frac{1}{25}\right)^{1/x}$ is

(a) $(-2, 0)$ (b) $(-2, 2)$

(c) $(-5, 5)$ (d) $(0, \infty)$

$5^{x+2} > (5^{-2})^{\frac{1}{x}}$

$5^{x+2} > 5^{\frac{-2}{x}}$

(for $a^m > a^n$, if $a > 1$, then $m > n$)

$x + 2 > -\frac{2}{x}$

$\left(x + 2 + \frac{2}{x}\right) > 0$ (True for any $x > 0$)

$\frac{x^2 + 2x + 2}{x} > 0$

$\Rightarrow x > 0$

$(0, \infty)$

QUESTION

The solution set of the inequality $5^{x+2} > \left(\frac{1}{25}\right)^{1/x}$ is

(a) $(-2, 0)$ (b) $(-2, 2)$

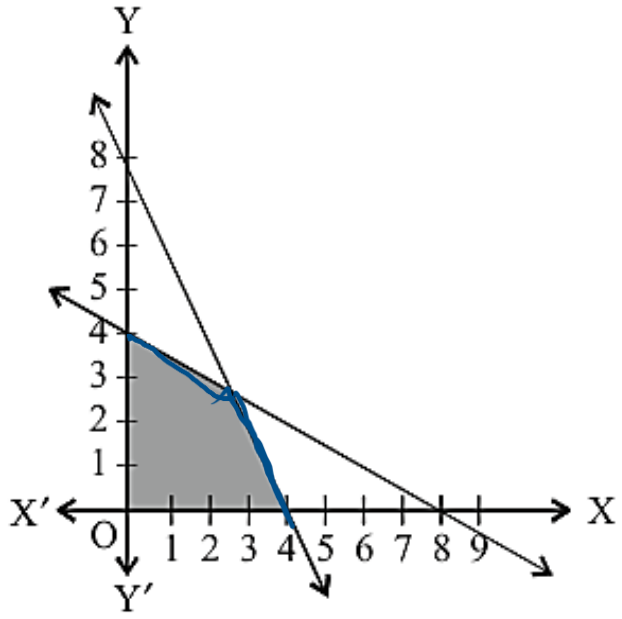
(c) $(-5, 5)$ (d) $(0, \infty)$

ANSWER : (d)

QUESTION

Which of the following linear inequalities satisfy the shaded region of the given figure.

I. $x + 2y \leq 8$ ✓
II. $x \geq 0, y \geq 0$ ✓
III. $x \leq 0, y \leq 0$
IV. $2x + y \leq 8$ ✓
V. $4x + 5y \leq 40$ ✓

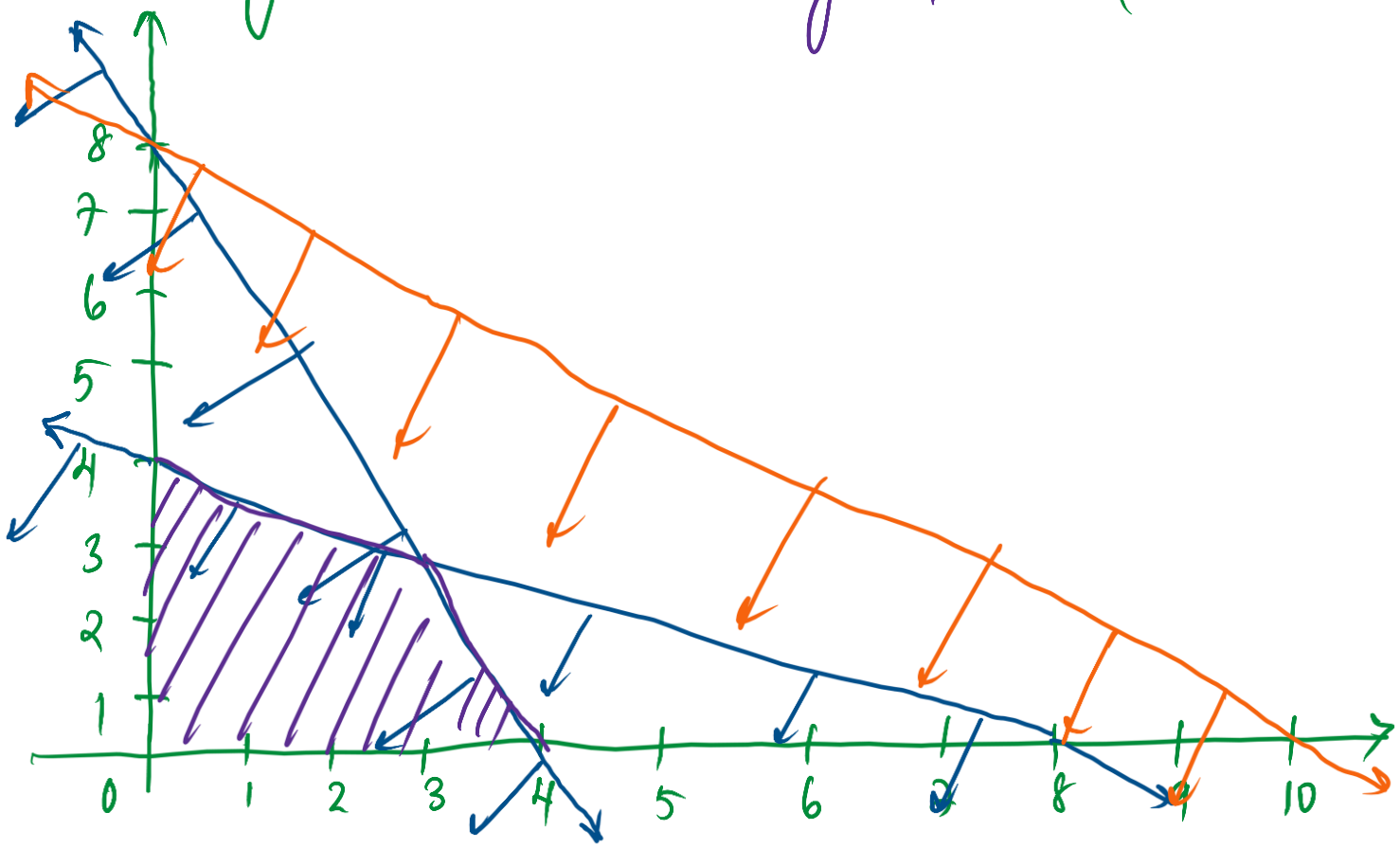


(a) I, III and V ✗
(b) I, IV and V ✓
(c) I, III and IV ✗
(d) I, II, and IV ✓

$x + 2y \leq 8 \longrightarrow x + 2y = 8 \longrightarrow (8,0), (0,4)$

$2x + y \leq 8 \longrightarrow 2x + y = 8 \longrightarrow (4,0), (0,8)$

$4x + 5y \leq 40 \longrightarrow 4x + 5y = 40 \longrightarrow (10,0), (0,8)$



QUESTION

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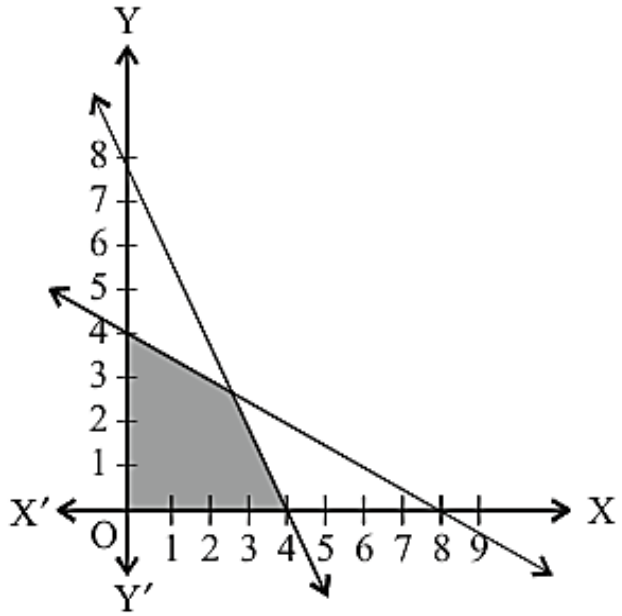
III. $x \leq 0, y \leq 0$
IV. $2x + y \leq 8$
V. $4x + 5y \leq 40$



(a) I, III and V
(b) I, IV and V
(c) I, III and IV
(d) I, II, and IV

ANSWER : (b) , (d)

QUESTION

Consider the following statements:

Statement-I : The solution set of the inequality

$\frac{3(x-2)}{5} \le \frac{5(2-x)}{3}$ is $(-\infty, 2)$.

Statement-II : The solution set of the inequality

$\frac{1}{2}\left(\frac{3x}{5}+4\right) \ge \frac{1}{3}(x-6)$ is $(-\infty, 120]$.

Choose the correct option.

(a) Statement I is true ✓

(b) Statement II is true

(c) Both are true

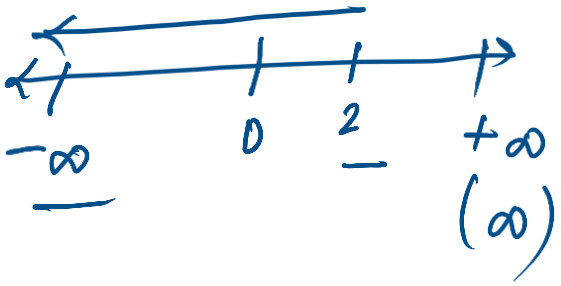
(d) Both are false

I $9(x-2) \le 25(2-x)$

$9x - 18 \le 50 - 25x$

$34x \le 68$

$x \le 2 \Rightarrow (-\infty, 2]$



II $\frac{1}{2}\left(\frac{3x}{5}+4\right) \ge \frac{1}{3}(x-6)$

$\frac{3x}{10} + 2 \ge \frac{1}{3}x - 2$

$4 \ge \frac{10x}{30} - \frac{9x}{30}$

$120 \ge x$

$(-\infty, 120]$ ✓

QUESTION

Consider the following statements:

Statement-I : The solution set of the inequality

$\frac{3(x-2)}{5} \leq \frac{5(2-x)}{3}$ is $(-\infty, 2)$.

Statement-II : The solution set of the inequality

$\frac{1}{2}\left(\frac{3x}{5}+4\right) \geq \frac{1}{3}(x-6)$ is $(-\infty, 120]$.

Choose the correct option.

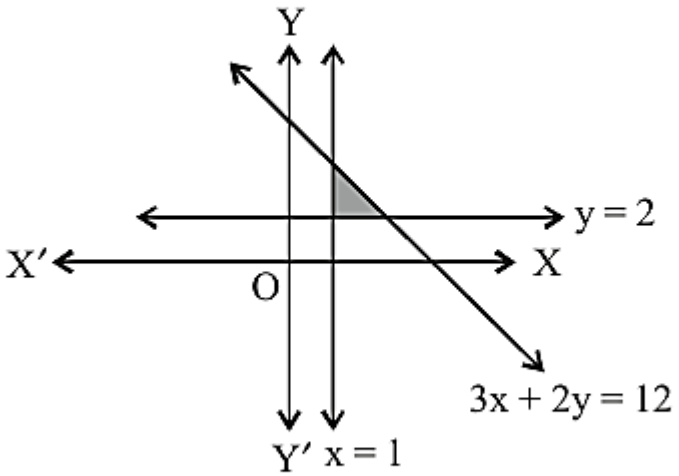
(a) Statement I is true
(b) Statement II is true
(c) Both are true
(d) Both are false

ANSWER : (b)

QUESTION

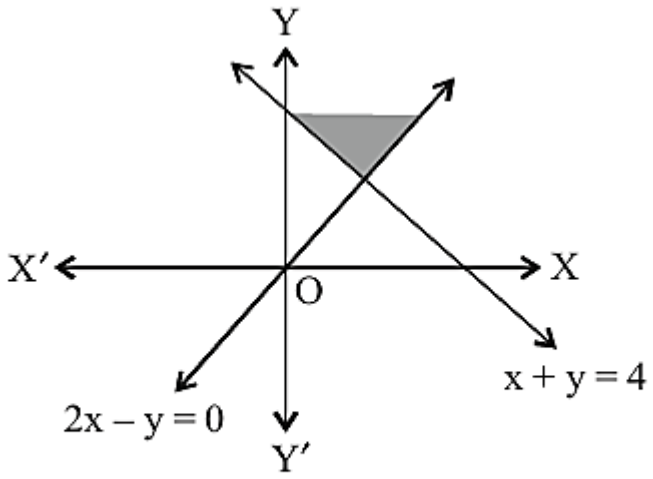
Which of the following is/are true?

I. The graphical solution of the system of inequalities $3x + 2y \leq 12$, $x \geq 1$, $y \geq 2$ is



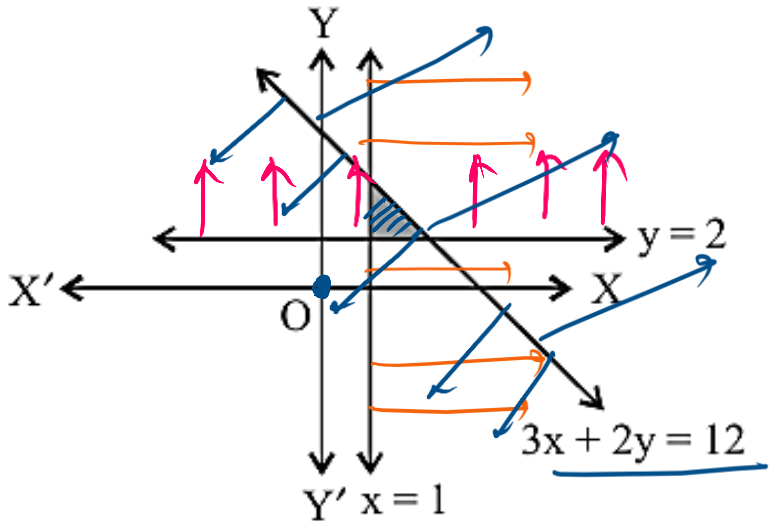
II. The region represented by the solution set of the inequalities $2x + y \geq 6$, $3x + 4y \leq 12$ is bounded.

III. The solution set of the inequalities $x + y \geq 4$, $2x - y > 0$ is



(a) Only I is true
(b) I and II are true
(c) I and III are true
(d) Only III is true

The graphical solution of the system of inequalities
$3x + 2y \leq 12$, $x \geq 1$, $y \geq 2$ is



$3x + 2y \leq 12$

$3x + 2y = 12$

$3(0) + 2(0) = 0 \leq 12$

II. The region represented by the solution set of the inequalities $2x + y \geq 6$, $3x + 4y \leq 12$ is bounded.

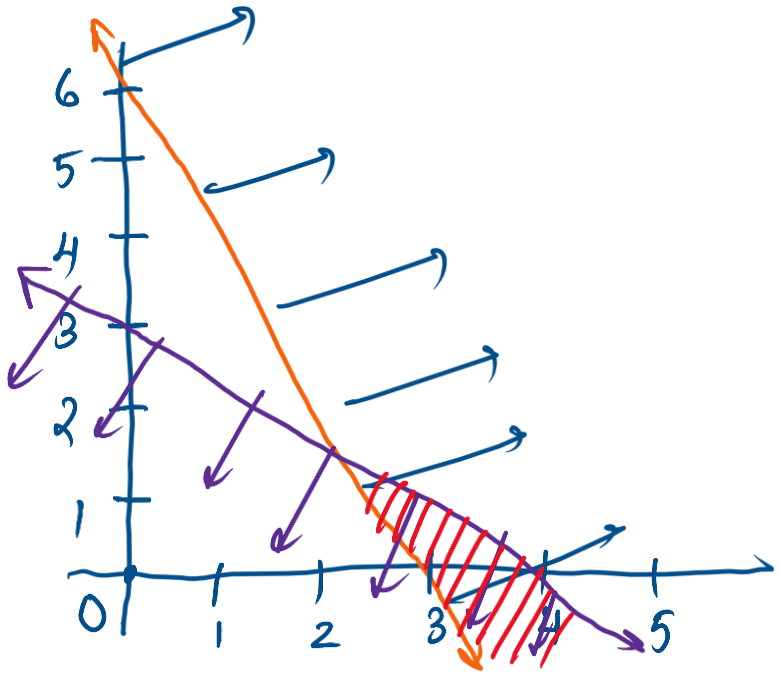
9

$2x+y=6$

$(3,0), (0,6)$

$3x+4y=12$

$(4,0), (0,3)$



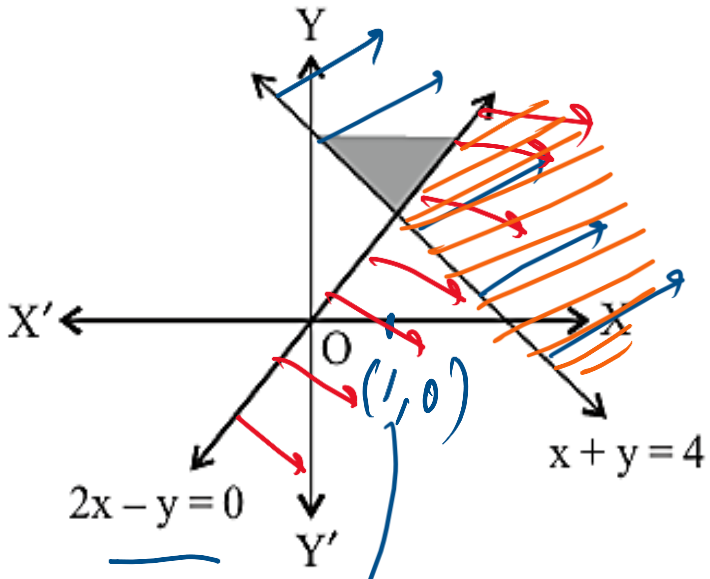
$2x+y \geq 6$

$0 \geq 6$ ✗

$3x+4y \leq 12$

$0 \leq 12$

III. The solution set of the inequalities $x + y \geq 4$, $2x - y > 0$ is



$2x - y > 0$

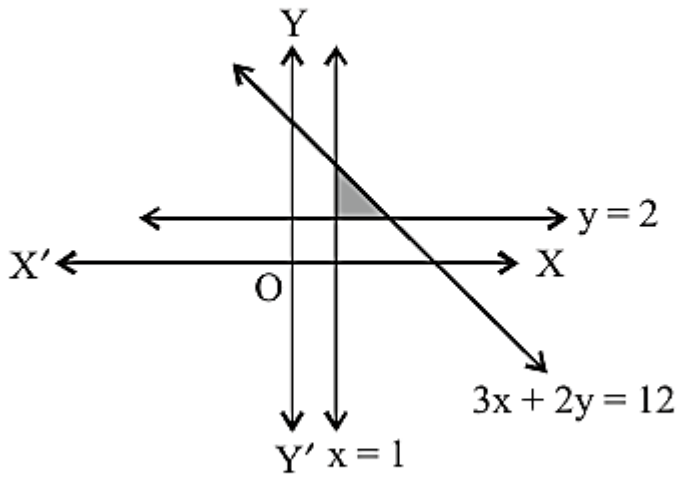
$2(1) - 0$

$2 > 0$

QUESTION

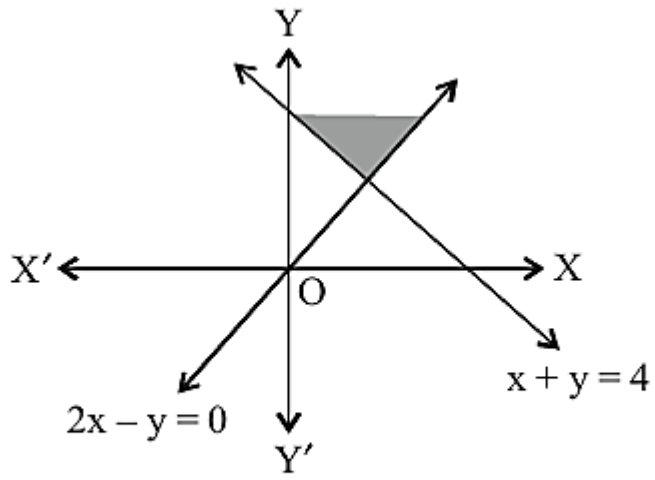
Which of the following is/are true?

I. The graphical solution of the system of inequalities $3x + 2y \leq 12$, $x \geq 1$, $y \geq 2$ is



II. The region represented by the solution set of the inequalities $2x + y \geq 6$, $3x + 4y \leq 12$ is bounded.

III. The solution set of the inequalities $x + y \geq 4$, $2x - y > 0$ is



(a) Only I is true
(b) I and II are true
(c) I and III are true
(d) Only III is true

ANSWER : (a)

QUESTION

Given that x, y and b are real numbers and $x < y$, $b < 0$, then

(a) $\frac{x}{b} < \frac{y}{b}$ (b) $\frac{x}{b} \leq \frac{y}{b}$

(c) $\frac{x}{b} > \frac{y}{b}$ ✓ (d) $\frac{x}{b} \geq \frac{y}{b}$

$x < y$

$\frac{x}{b} \quad \frac{y}{b}$

$x \times \frac{1}{b} > y \times \frac{1}{b} \Rightarrow \frac{x}{b} > \frac{y}{b}$

$-ve$

$\frac{x}{6} \quad \frac{y}{8}$

$6 < 8$

$6 \quad -2 \quad -2$

$-3 > -4$

$\left(\frac{6}{-2}\right) \quad \left(\frac{8}{-2}\right)$

QUESTION

Given that x, y and b are real numbers and $x < y$, $b < 0$, then

(a) $\frac{x}{b} < \frac{y}{b}$

(b) $\frac{x}{b} \leq \frac{y}{b}$

(c) $\frac{x}{b} > \frac{y}{b}$

(d) $\frac{x}{b} \geq \frac{y}{b}$

ANSWER : (c)

QUESTION

One of the roots of the quadratic equation $ax^2 + bx + c = 0$, $a \neq 0$ is positive and the other root is negative. The condition for this to happen is

(a) $a > 0, b > 0, c > 0$ (b) $a > 0, b < 0, c > 0$ ✓

(c) $a < 0, b > 0, c < 0$ (d) $a < 0, c > 0$

$ax^2 + bx + c = 0$

α β

$\alpha > 0$ (+ve) $\beta < 0$ (−ve)

$\alpha\beta \rightarrow$ −ve < 0

$\alpha\beta = \frac{c}{a} < 0 \Rightarrow$ (−ve)

either c is negative ⇒ a is +ve)

or a is ⇒ c is +ve)

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One of the roots of the quadratic equation $ax^2 + bx + c = 0$, $a \neq 0$ is positive and the other root is negative. The condition for this to happen is

(a) $a > 0, b > 0, c > 0$ (b) $a > 0, b < 0, c > 0$

(c) $a < 0, b > 0, c < 0$ (d) $a < 0, c > 0$

ANSWER : (d)

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LIVE

MATHS

LOGARITHMS

CLASS 1

NAVJYOTI SIR

Crack
EXAMS