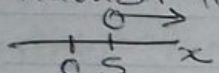
INEQUALITIES TEST A (43) (147)

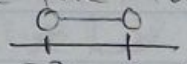
Solution Sets and the Number line

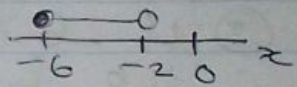
① (i) list the members of the solution set of each of the following, taking x to be an integer.
(ii) Represent each solution set on a number line.

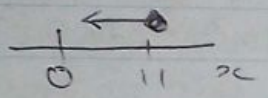
(a) $x < -3$ (b) $x \geq 3$ (c) $x < 5$
(d) $-5 < x < 2$ (e) $-10 < x \leq -5$ (f) $-7 \leq x \leq 0$
(g) $-3 \leq x \leq 4\frac{1}{2}$ (h) $-3{,}8 < x < 6{,}5$ (i) $-10\frac{1}{3} < x < -3\frac{1}{4}$ (13)

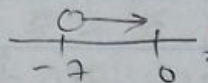
② The following are solution sets given on a number line. Give the inequalities in x

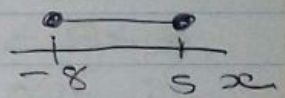
(a) 

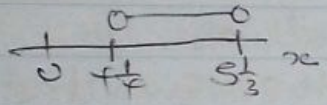
(b) 

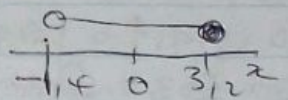
(c) 

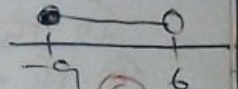
(d) 

(e) 

(f) 

(g) 

(h) 

(i) 

(9)

③ Solve the following inequalities

(a) $x + 3 \geq 5$ (b) $7 - x < 9$
(c) $5x - 20 \leq 0$ (d) $-4x < 24$
(e) $6x - 8 \geq x + 7$ (f) $8x - (2x - 7) \geq 37$
(g) $5(x - 4) < 2(2x + 11)$ (h) $\frac{x+8}{7} - 1 < \frac{2x-4}{3}$ (16)

④ Represent each of the solution sets in question 3 a – h on a number line.

30 148

INEQUALITIES TEST B

(1) Given that $-4 \leq x \leq 2$ and $6 \leq y \leq 12$, find (a) the greatest value of $y - x$
(b) the least value of xy
(c) the least value of $x^2 + y^2$

(2) If $-2 \leq x \leq 5$ and $-4 \leq y \leq 3$, x and y being integers; find:
(a) The maximum value of $x - y$
(b) the maximum value of $x^2 + y^2$
(c) the least value of xy
(d) the greatest value of $(xy)^2$.

(3) If $-6 \leq x \leq 4$ and x is an integer, for the following expressions find:
(a) $7 - x$ (b) $x - 7$ (c) $9x^2$ (d) $2 + 3x$
(i) the smallest and
(ii) the largest possible values.

(4) If $-5 \leq x \leq 3$ find (a) the smallest (b) the largest possible values of the following
(i) $9 - x$ (ii) $x - 9$ (iii) $x^2 - 9$ (iv) $9x$

(5) $-3 \leq p \leq 4$ and $1 \leq q \leq 5$ find
(i) the greatest value of
(a) $p + q$ (b) $q - p$ (c) pq.
(ii) the smallest value of
(a) $p + q$ (b) $p - q$ (c) p/q

INEQUALITIES TEST C

(1) Given that $-3 \leq x \leq 2$ and $2 \leq y \leq 5$, find
(i) the greatest value of $x+y$ (1)
(ii) the smallest value of $y-x$ (1)
(iii) the smallest value of xy (1)
(iv) the greatest value of $y-x$ (1) [4]

(2) Given that $2 \leq a \leq 6$ and $-3 \leq b \leq 1$, find
(i) the smallest value of a^2+b^2 (1)
(ii) the smallest value of ab (1)
(iii) the largest value of a^2+b^2 (1)
(iv) the largest value of $a-b$ (1) [4]

(3) Given that $-4 \leq p \leq 2$ and $-5 \leq q \leq 3$, find (i) the greatest value of p^2+q^2 (1)
(ii) the least value of pq (1)
(iii) the greatest value of pq (1)
(iv) the least value of $p-q$. (1) [4]

(3) Given that $-3 \leq m \leq 2$ and $3 \leq n \leq 5$, find (i) the least value of m^2-n^2 (1)
(ii) the least value of mn (1)
(iii) the greatest value of m^2n (1)
(iv) the greatest value of m/n. (1) [4]

42 160

INEQUALITIES TEST D

(1) Solve the Inequalities illustrating each solution on a number line

(a) $-1 < 2x+3 \leq 7$ (2) (b) $3 \leq 4x-1 < 11$ (2)

(c) $-3 < 4-2x \leq 4$ (2) (d) $-1 \leq 2-3x < 5$ (2)

(e) $x+2 < 3x-2 \leq 2x+3$ (2) (f) $x+2 \leq 5-x < x+7$ (2)

(2) List the Integers which satisfy the Inequalities

(a) $-2 < 2x+3 \leq 10$ (2) (b) $1 \leq 3x+7 < 10$ (2)

(c) $7 < 3-2x < 9$ (2)

(3) List the Integers which satisfy the Inequalities

(a) $-1 < 2x-3 \leq 5$ (2) (b) $-4 \leq 2x+3 < 7$ (2)

(c) $-6 < 2x-5 < 3$ (2)

(4) Solve the Inequalities illustrating each Solution on a number line

(a) $4x-5 > 7$ (2) (b) $4-2x \leq 7$ (2) (c) $5-3x > 14$ (2)

(d) $3+4x \geq 11$ (2) (e) $3x-4 \geq 5x+1$ (2)

(5) Find the smallest Integer which satisfy each of the following Inequalities

(a) $2-x < x-1$ (2) (b) $2x+7 \geq 2$ (2) (c) $11-2x < 1$ (2)

(d) $4x+5 > x-4$ (2)

(27) (161)

INEQUALITIES TEST 1

(1) Find the largest prime number which satisfies each of the following inequalities

(a) $7 - 2x \geq 1$ (b) $x - 7 \leq 3$ (c) $15 - x > x - 7$

(d) $x - 8 < 8$.

(2) Solve the inequalities

(a) $3(x-2) + 1 \leq 2(x+3) - 4$ (c) $\frac{3-2x}{4} \geq \frac{x-3}{3}$

(b) $2(2x-3) + 2 \leq 3(3x+1)$

(3) $\frac{1-3x}{4} \leq$ find

(i) The smallest integer

(ii) the smallest even number

(iii) the smallest prime number

(iv) the smallest rational number

(v) the smallest real number which satisfies this inequality.

(4) $\xi = \{\text{integers}\}$, $A = \{x : 4x - 7 > 3\}$

$B = \{x : 2x - 1 \geq 5\}$ $C = \{x : x - 3 < 4\}$

(a) find the smallest member of A

(b) find the smallest member of B

(c) find the largest member of C

(26) (162)

INEQUALITIES TEST F

(1) ξ = {natural numbers} $A = \{x : 3x - 7 > 2\}$
$B = \{x : 4x - 9 \leq 7\}$.
(a) Find the smallest member of A (1)
(b) Find the largest member of B (1)
(c) find the smallest member of C (1)
(d)

(2) Find the largest odd number which satisfies each of the following inequalities.
(a) $2x - 5 \leq 1 + x$ (2) (b) $2x - 3 < 7$ (2)
(c) $2x - 5 < 4$ (2) (d) $3x - 9 \leq 12$. (2)

(3) Solve the inequalities illustrating each solution on a number line.
(a) $3x - 2 < 4$ (2) (b) $7 - 2x \geq 2$ (2) (c) $5 - 2x < 9$ (2)
(d) $2x - 4 \geq 2$ (2) (e) $3 - 2x \leq 6$ (2) (f) $2x + 7 < 1 - x$ (3)

(4) $2x - 3 \leq 6$
(a) Find the largest integer which satisfies the inequality (1)
(b) find the largest prime number which satisfies this inequality (1)
(c) find the largest rational number which satisfies this inequality

(5) x is such that $2x + 5 < 11$ and $5x \geq 2x - 9$
find the range of values of which satisfy both inequalities.

(163)

INEQUALITIES TEST 9 (21)

(1) List the integer values of x which satisfy the following sets. (a) $\{x : -4\frac{1}{2} < x < 2\frac{2}{3}\}$ (1)

(b) $\{x : -5 \leq x < -1\frac{3}{4}\}$ (1)

(c) $\{x : x$ is a multiple of 7 and $40 < x < 69\}$. (1)

(2) x is a perfect square which satisfies both $2 - x < 3x - 10$ and $x - 17 \leq 32$. find all the possible values of x. (3)

(3) x is such that $\frac{x}{2} - \frac{3}{4} < \frac{5x}{6} + \frac{7}{12}$ and $\frac{2x}{5} \leq 7 - x$. find the values of x given that x is an odd whole number. (3)

(4) List the integer values of x, where x is prime, satisfying both the inequalities: $x > 18$; $3x + 2 < 93$. (3)

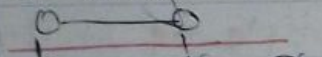
(5) Express the inequality $3x - 2 < 10 + x < 2 + 5x$ in the form $a < x < b$ where a and b are numbers. Hence find the perfect square which satisfies the given inequality (3)

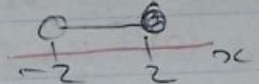
(6) List the integer values of x which satisfy $3x - 4 < 27 \leq 4x - 5$ (3)

(7) Find an integer value of x such that $3x + 5 < 1 < 2x + 6$. (3)

INEQUALITIES TEST 14

(1) Express each inequality in the form $a * x * b$ where a and b are numbers and $*$ may be $<$ or $\leq$

(a) 

(b) 

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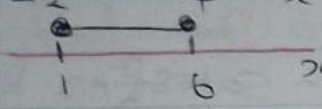
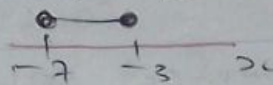
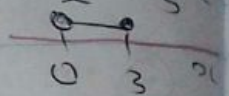
(d) 

(e) 

(f) 

(2) Illustrate each of the following inequalities on a number line

(a) $-4 \leq x \leq 1$ (b) $-1 < x < 4$ (c) $-5 \leq x < -2$

(d) $0 \leq x \leq 3$ (e) $-1 < x < 1$ (f) $7 \leq x \leq 8$.

(3) Express each of ~~these~~ the following pairs of simultaneous inequalities in the form $a * x * b$ where a and b are numbers and $*$ may be $<$ or $\leq$.

(a) $x \geq 3$, $2x - 3 \leq 15$ (b) $25 > 1 - 6x$; $1 > 3x + 7$

(c) $2x - 7 < 3 < 27 + 4x$ (d) $3x + 8 \leq 0 \leq 21 + 4x$

(e) $5x - 36 < -1 \leq 2x - 1$

(4) State the integer values of x which are members of the following sets.

(a) $\{x : 2 \leq x < 9\}$ (b) $\{x : 1\frac{1}{2} < x < 7\frac{3}{4}\}$

(c) $\{x : -7\frac{3}{4} < x < -1\frac{1}{2}\}$ (d) $\{x : -2\frac{1}{4} < -1 \leq 2x - 1\}$

(38) (165)

INEQUALITIES TEST 1

① If $6x < 2 - 3x$ and $x - 7 < 3x$, what single range of values of x satisfies both inequalities? (4)

② What is the range of values of x for which $3(1-x) < 3$ and $3(1-x) \geq 0$ are both satisfied? (4)

③ y is such that $4y - 7 \leq 3y \leq 5y + 8$. Express this inequality in the form $a \leq y \leq b$ where a and b are both integers. (5)

④ Draw the regions defined by each of the following. [Use solid and broken lines, leave each region unshaded]

(a) $y \geq 0$; $y < 3x$; $x + y \leq 4$ (3)

(b) $x \geq -3$; $y \leq 2$; $x - y < 2$. (6)

(c) $y \leq 5$, $x - y \leq 1$, $4x + 3y \geq 12$ (3)

(d) $x \geq 0$, $y \geq 0$, $x + y < 6$, $y - x < 2$. (4)

⑤ Solve each of the following graphically for integral values of x and y.

(a) $y \geq 0$; $x - y \geq 1$; $3x + 4y < 12$ (5)

(b) $y \geq 1$; $y - x < 5$; $2x + y \leq 0$ (3)

(c) $y > -2$; $x > 0$; $2x + y < 4$ (3)

(d) $x + y \leq 2$; $x - y \leq 2$; $2x + y \geq 2$ (3)

(e) $y \geq 0$; $y \leq 4$; $4x + 3y > 0$, $5x + 2y < 10$ (4)