

Name _____ School _____

INTERMEDIATE DIVISION
Category 3: Inequalities and Simple Equations
CALCULATORS NOT ALLOWED

1. (2 pts.) Solve $-3x - 7 \geq 5$ for a real x .

1. _____

2. (3 pts.) Solve $x + (x + 1) + (x + 2) + (x + 3) = (x + 4) + (x + 5) + (x + 6)$ for all real x .

2. _____

3. (5 pts.) Solve $-13 - 7(x + 2) < 6x + 3(4 - x)$.

3. _____

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INTERMEDIATE DIVISION
Category 3: Inequalities and Simple Equations
CALCULATORS NOT ALLOWED

1. (2 pts.) Solve for x .

$$2x + 6 > x$$

1. _____

2. (3 pts.) Solve for x .

$$-x + 4 < 3x - 20 < -x + 100$$

2. _____

3. (5 pts.) Solve for x .

$$6x - 4 < 3x + 20 < 2x + 100$$

3. _____

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INTERMEDIATE DIVISION
Category 3: Inequalities and Simple Equations
CALCULATORS NOT ALLOWED

1. (2 pts) Solve for x. $-14 \leq 2(5 - 3x)$ 1. _____

2. (3 pts) Solve for x. $|x - 3| = -2x - 10$ 2. _____

3. (5 pts) Solve the inequality for x. $x^2 - 2x - 15 < 0$ 3. _____

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Intermediate Division

Category 3

Inequalities & Simple Equations

NO CALCULATORS

1. (2pts) Solve for x : $x + x + x + x = x + x + x$ ANS _____

2. (3pts) Solve for x : $2x + 3x + 4x = 4x + 3x + 2x$ ANS _____

3. (5pts) $2x - 3 > 5 - 3x$ ANS _____

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I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N

Category 3. Inequalities & Simple Equations

CALCULATORS ARE NOT ALLOWED IN THIS CATEGORY

Solve for x.

1. (2 Pts.)

$$x - 9 < 10 - x$$

ANS. _____

2. (3 Pts.)

$$9 - x > 10 - x$$

ANS. _____

3. (5 Pts.)

$$|9 - x| < |10 - x|$$

ANS. _____

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I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N

Category 3. Inequalities & Simple Equations

CALCULATORS ARE NOT ALLOWED IN THIS CATEGORY

1. (2 Pts.) Solve for x. $x + x^2 + x^3 > 3$

ANS. _____

2. (3 Pts.) Solve for x. $\frac{x}{x-4} \neq 0$

ANS. _____

3. (5 Pts.) Solve for x. $\frac{x-3}{4} = \frac{x-4}{3}$

ANS. _____

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I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N

Category 3. Inequalities and Simple Equations

CALCULATORS ARE NOT PERMITTED IN THIS CATEGORY

1. (2 Pts.) Solve for x.

$$(x) + (x + 1) + (x + 2) = (x + 3) + (x + 4)$$

ANS. _____

2. (3 Pts.) Solve for x.

$$\frac{(x)(x+1)(x+2)}{(x+1)(x+2)} = 0$$

ANS. _____

3. (5 Pts.) Solve for x.

$$x + x^2 + x^3 + x^4 = 0$$

Hint: 2 Answers

ANS. _____

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I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N**Category 3: Inequalities & Simple Equations****CALCULATORS MAY NOT BE USED IN THIS CATEGORY****ALL ANSWERS WILL BE REAL NUMBERS**

1. (2 Pts.) Solve for y.

$$5 - y > 4 - y > 3 - y$$

ANS. _____

2. (3 Pts.) Solve for x.

$$x^2 > 4$$

ANS. _____

3. (5 Pts.) Solve for x.

$$\frac{-3(x-4)}{3(x-5)} > -1$$

ANS. _____

Name _____ No. _____ School _____

I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N

Category 3. Inequalities & Simple Equations

CALCULATORS MAY NOT BE USED IN THIS
CATEGORY

1. (2 Pts.) Solve for x. $5 - x < 6 - x$

ANS. All R #'s

2. (3 Pts.) Solve for x. $5 - x < 6 + x$

$$\begin{aligned} -1 &< 2x \\ -\frac{1}{2} &< x \end{aligned}$$

ANS. $x > -\frac{1}{2}$

3. (5 Pts.) Solve for x. $5 - x < 6 - x < 7 + x$

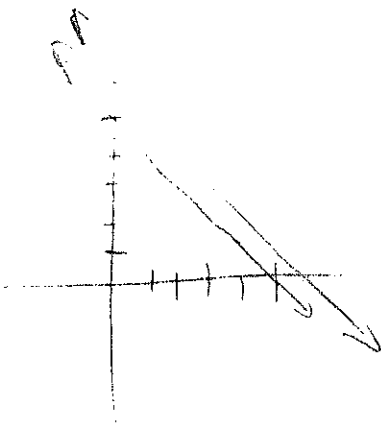
$$5 < 6 < 7 + 2x$$

$$-2 < -1 < 2x$$

$$x > -1$$

$$x > -\frac{1}{2}$$

ANS. $x > -1$



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I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N

Category 3. Inequalities & Simple Equations

CALCULATORS MAY NOT BE USED IN THIS CATEGORY

(Answers may be \emptyset , all reals, or a specific number.)

1. (2 Pts.) Solve for x : $x < 3$ and $x > -5$ and $3x = -27$.

ANS. \emptyset No Solution

2. (3 Pts.) Solve for x : $\frac{x+x}{x} < \frac{x}{x+x}$

$\frac{2x}{x} < \frac{x}{2x}$

ANS. No Solution

3. (5 Pts.) Solve for x : $-3(5 - 4x) > 3(-5 + 4x)$.

ANS. No Solution

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I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N

Category 3. Simple Equations + Inequalities (TEAM)

PASS IN ONLY ONE PAPER

1. (2 Pts.) Solve for x.

$$|5x| \geq |6x|$$

ANS. _____

2. (3 Pts.) Solve for x.

$$5x + 6 = 6x + 5$$

ANS. _____

3. (5 Pts.) Solve for x.

$$|x+7| = |x-3|$$

ANS. _____

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Category 3. Simple Equations & Inequalities (TEAM)

PASS IN ONLY ONE PAPER

1. (2 pts.) Solve for x. $5 - x = x - 5$ ANS. _____

2. (3 Pts.) Solve for x. $5(5 - x) = 6(x - 5)$ ANS. _____

3. (5 Pts.) Solve for x. $-5x > (x - 5)$ ANS. _____

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INTERMEDIATE DIVISION

Category 4. Simple Equations & Inequalities (TEAM)

PASS IN ONLY ONE PAPER

1. Solve for x: $5x + 3x = 4x + 5x$ ANS. _____

2. (3 Pts.) $5 - x > x - 5$ ANS. _____

3. (5 Pts.) $|x + 5| > 6$ ANS. _____

Intermediate Division

Nov 80

Simple Equations and Inequalities ~~Form~~1. Solve for x .

$$3x + 4 < 5x + 6$$

2. Solve for x .

a. $x + 3 = 3 + x$

b. $3(x + 1) = 3x + 3$

c. $4x + 5 = 4x + 6$

3. Solve for x .

$$x^2 + 5 > 30$$

Name _____

Nc. _____

Name _____

Nc. _____

School _____

Name _____

Nc. _____

INTERMEDIATE DIVISION

Category 4 Simple Equations and Inequalities (TEAM)

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PASS IN ONLY ONE PAGE

Solve for x in each of the following.

1. (2 Pts.) $.2x - 2 = .2$

ANS. _____

2. (3 Pts.) $.2(x + 0.2) > 2$

ANS. _____

3. (5 Pts.) $2 - .2x < -2$

ANS. _____

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PASS IN ONLY ONE PAPER

INTERMEDIATE DIVISION

Category ³/~~4~~ Simple Equations and Inequalities (~~PLAN~~)

1. (2 Pts.) Solve for x.

$$\frac{2}{3}x - 1 = 1 - \frac{1}{3}x$$

ANS. _____

2. (3 Pts.) Solve for x.

$$x^2 < x$$

ANS. _____

3. (5 Pts.) Solve for x.

$$-3(x - 2) > -2(x - 1)$$

ANS. _____

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Category 4. Inequalities (TEAM)

I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N

PASS IN ONLY ONE PAPER

1. (2 Pts.) Express this statement using inequality signs:
e is greater than 2.71 and less than 2.72.

ANS. _____

2. (3 Pts.) Solve for x.
 $-1 \leq 7 - 2x < 3$

ANS. _____

3. (5 Pts.) Solve for x:
 $x^2 + 9 \leq 25$

ANS. _____

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I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N

Category 4. Inequalities (TEAM)

PASS IN ONLY ONE PAPER

Solve for x.

1. (2 Pts.) $0 < 2x - 5 \leq 7$

ANS. _____

2. (3 Pts.) $|5 - 3x| < -5$

ANS. _____

3. (5 Pts.) $(x+3)(x-2) > 6$

ANS. _____

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 Name _____ No. _____

I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N

Category 4. Inequalities (TEAM)

PASS IN ONLY ONE PAPER

1. (2 Pts.) Four times a number minus six is greater than six but less than twenty-two. Find all numbers that satisfy these conditions.

ANS. _____

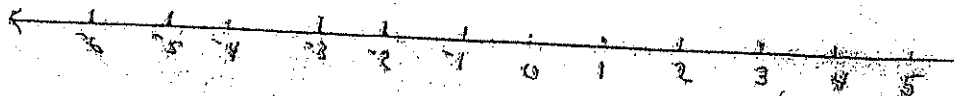
2. (3 Pts.) Solve for x.

$$|8 - 3x| < 9$$

ANS. _____

3. (5 Pts.) Solve for w. Show answer on number line.

$$\frac{w - 1}{w^2 - 3w - 18} \leq 0$$



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I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N

CATEGORY 4. Inequalities (TEAM)

PASS IN ONLY ONE PAPER

1. (2 Pts.) Solve for x . $5 + x > 5 - x$

ANS. _____

2. (3 Pts.) Solve for x .

$$5 + \frac{1}{3}x > 5(5+x)$$

ANS. _____

3. (5 Pts.) If $2x - 3y = C$ and $3x - 2y = D$, in terms of C and D , how much bigger is x than y ?

ANS. _____

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I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N

Category 4. Inequalities (TEAM)

PASS IN ONLY ONE PAPER

1. (2 Pts.) Given the inequality $2x - 3y < 1$, determine five different values for y , if $x = 2$.

1) _____
2) _____
3) _____
4) _____
5) _____

2. (3 Pts.) Solve the inequality $3y + 2 < 5x - 4y$ for y .

ANS. _____

3. (5 Pts.) Solve the inequality for t .

$$\frac{t-2}{3} + 1 > \frac{t+3}{4}$$

ANS. _____

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I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N

Category 4 Inequalities (TEAM)

PASS IN ONLY ONE PAPER

1. (2 Pts.) Solve for x. $x^2 < x$

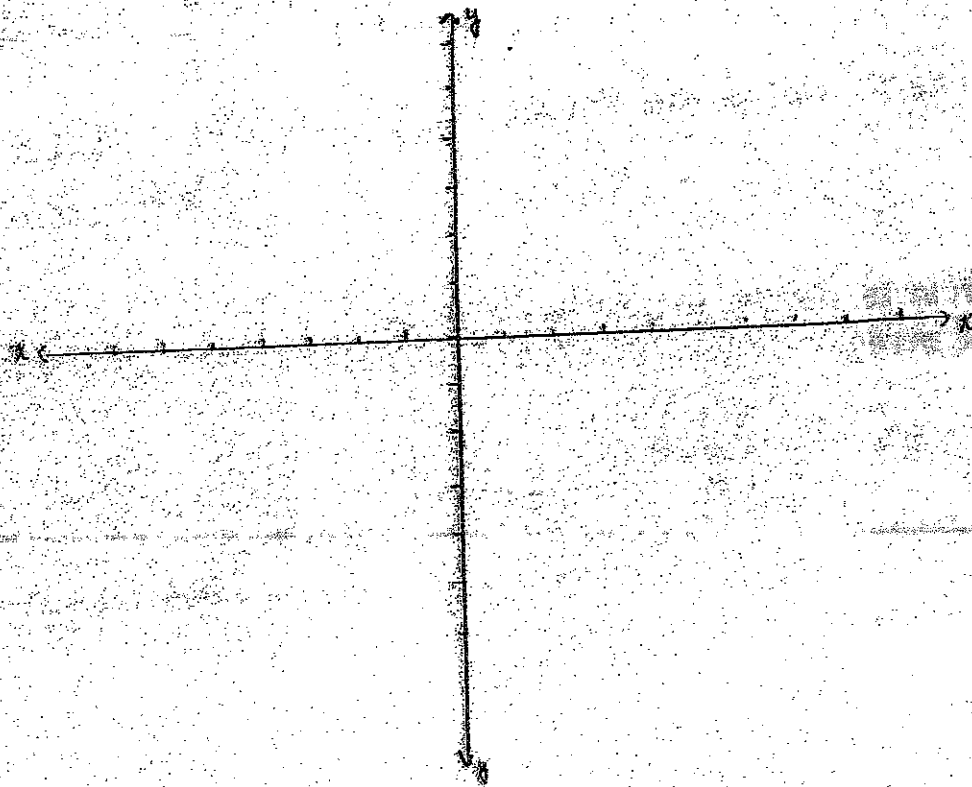
ANS. _____

2. (3 Pts.) Solve for x. $-(x - 5) < -(x - 5)$

ANS. _____

3. (5 Pts.) Show the intersection of these inequalities.

a) $y < 2x + 3$ b) $x < 4$ c) $2x + 4y > 12$



Inequalities

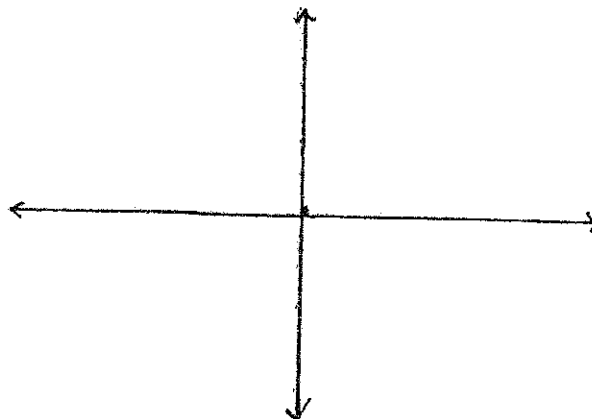
Name: _____

(2 points)

Graph the following system on a coordinate plane. Shade the solution region.
Show x and y - intercepts

$$y < 0$$

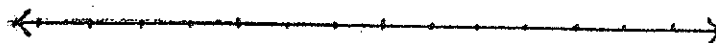
$$x - y > -1$$



(3 points)

Graph the solution on a number line.

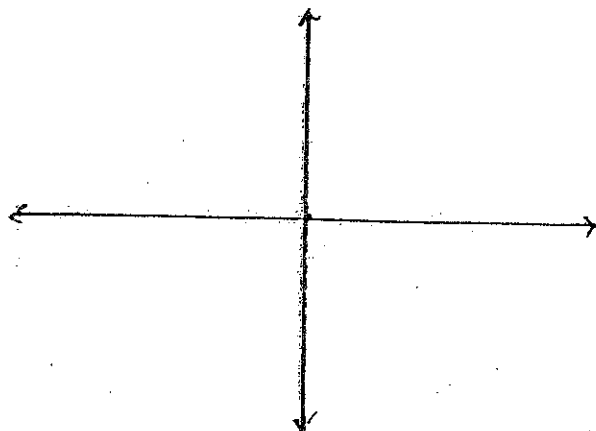
$$\frac{8-11x}{4} \leq 13$$



(5 points)

Graph on a coordinate plane: $|x-3| \geq 5$

Shade the solution region.



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INTERMEDIATE DIVISION

Category 4. Inequalities (TEAM)

Pass in only one paper

1. If $0 < x < 1$ would a) x^2 be 1) greater than x
2) same as x
3) less than x

- b) x^3 be 1) greater than x
2) same as x
3) less than x

- c) x^4 be 1) greater than x
2) same as x
3) less than x

Circle the answer(s) that apply.

2. (3 Pts.) Solve for x .

$$|x - 5| < -8$$

ANS. _____

3. (5 Pts.) $|x - 3| + |x - 2| + |x + 1| = 11$ (Hint: There is more than 1 answer.)

ANS. _____

Inequalities

Name: _____

2 points Find the solution set for $x^2 - 2x - 15 \geq 0$

3 points Find the solution set for $\frac{x+2}{x-3} < 2$

5 points Draw the graph of $\{(x,y)/2x-y \geq 4\} \cup \{(x,y)/x+y \leq 5\}$

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INTER-MEDIATE DIVISION

Category 4. Inequalities (TEAM)

PASS IN ONLY ONE PAPER

1. (2 Pts.) If $a < b$ and you multiplied each side by c getting $ac > bc$, what could you say
(if anything) about c ?

ANS. _____

2. (3 Pts.) Solve the inequality $4x + 7 \geq 2x - 3$.

ANS. _____

3. (5 Pts.) Find a and b , if $2 < x < 4$ then $a < \frac{1}{x-6} < b$.

ANS. _____

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I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N

Category 4. Inequalities (TEAM:

PASS IN ONLY ONE PAPER

1. (2 Pts.) If $3 < x < 4$, then $5 < \underline{\hspace{1cm}} < 6$.

ANS. _____

2. (3 Pts.) Solve for x .

$$\frac{1}{2}(x+4) < \frac{1}{3}(x-6)$$

ANS. _____

3. (5 Pts.) Solve for x .

$$x^2 - x - 12 < 0$$

ANS. _____

Name _____ No. _____ School _____

I-N-T-E-R-M-E-D-I-A-T-E D-I-V-I-S-I-O-N

Category 3. Inequalities and Simple Equations

CALCULATORS MAY NOT BE USED IN THIS CATEGORY

1. (2 Pts.) Solve for x . $5x = 6x$

ANS. _____

2. (3 Pts.) Solve for x . $5x + 6 \leq 6x + 5$

ANS. _____

3. (5 Pts.) Solve for x . $5 = 4x < 4 = 5x$

ANS. _____


Inequalities and Simple Equations


Here are some thoughts for you to review:

Absolute Value

Ex.: $|x-3|=7 \Rightarrow x-3=-7 \text{ or } x-3=7$
 $x=-4 \text{ or } x=10$
 $\boxed{\{-4, 10\}}$

N.B.: Absolute value can never be less than zero (by def.).

Ex.: $|x-3|>7 \Rightarrow x-3<-7 \text{ or } x-3>7$
 $x<-4 \text{ or } x>10$

 $\boxed{\{x | x < -4 \cup x > 10\}}$

$|x-3|<7 \Rightarrow -7 < x-3 < 7$
 $-4 < x < 10$

 $\boxed{\{x | -4 < x < 10\}}$

"No Solution": Don't be afraid to conclude this!

Ex.: Find all $x \in \mathbb{R}$ such that $3x-2 < 10$ and $x+1 \geq 9$.

$3x-2 < 10$ AND $x+1 \geq 9$
 $3x < 12$ $x \geq 8$
 $x < 4$ AND $x \geq 8 \dots$

\emptyset

Do you know a number that is less than 4 AND greater than or equal to 8 ... didn't think so. 😊