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MAC 1105 1130 - 1245

Mini-Project 1 8/30

All of 1.5 Solving Inequalities
All of 1.6 Equations and Inequalities Involving Absolute Value

Library of Function

$f(x) = \square$ ($\square$ is a constant)

Identity	$f(x) = x$
Square	$f(x) = x^2$
Square root	$f(x) = \sqrt{x}$
Cube	$f(x) = x^3$
Cube root	$f(x) = \sqrt[3]{x}$
Absolute v.	$f(x) = \lvert x \rvert$
Reciprocal	$f(x) = 1/x$

5 Steps

1. Assume a value for x, then solve for y
2. Express x and y as an ordered pair (x, y)
3. Repeat steps 1 and 2 until you have enough points
4. Determine the scale of the x-axis and y-axis
5. Plot the ordered pairs, then connect the points to graph the equation

*f(x) can also be written as "y"

SL Hours
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M 10-11am - 1-2pm
W 1-3pm
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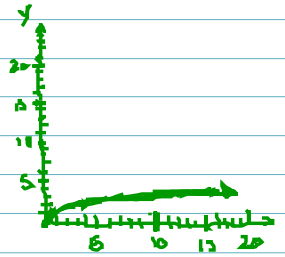
3.4.1 Graph $f(x) = \sqrt{x}$

x	y (or f(x))
0	0
1	1
4	2
9	3
16	4
25	5
36	6
49	7
⋮	⋮



1.5) Solving Inequalities

$x + 2 + 6 > 2x + 5(x + 1)$ ← simplify

$5x + 5$

$x + 8 > 7x + 5$

*The three Goals!

$3 < x$

$x > 3$

$2 < 3$

$(-1)(2) \quad (-1)(3)$

$-2 > -3$

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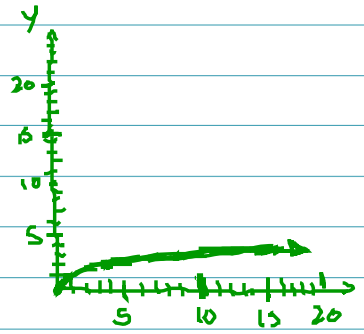

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$x > 3$

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$-2 > -3$

(44) Solve the inequality

$$(x+3)(x-4) > (x-2)(x+2)$$

$$x^2 - 4x + 3x - 12 > x^2 + 2x - 2x - 4$$

$$x^2 - x - 12 > x^2 - 4$$

$$-x^2 \qquad -x^2$$

$$-x - 12 > -4$$

$$+12 \qquad +12$$

$$-x > 8$$

$$-1 * -x > -1 * 8$$

$$\boxed{x < -8}$$

Solve Combined Inequalities

(40) Solve the Inequality

$$-9 < 2x - 1 < 1$$

$$+1 \quad +1 \quad +1$$

$$\frac{-8}{2} < \frac{2x}{2} < \frac{2}{2}$$

$$-4 < x < 1$$

*Remember, whatever you do to one side, you must do to the other sides

(48) Solve the Inequality

$$\frac{1}{3} \leq \frac{x+1}{5} < \frac{5}{8} \qquad \text{LCD} = 120$$

$$\overset{40}{\cancel{120}}\left(\frac{1}{\cancel{3}}\right) \leq \overset{24}{\cancel{120}}\left(\frac{x+1}{\cancel{5}}\right) < \overset{15}{\cancel{120}}\left(\frac{5}{\cancel{8}}\right)$$

$$40 \leq 24(x+1) < 15 \cdot 5$$

$$40 \leq 24x + 24 < 75$$

$$16 \leq 24x < 51$$

$$\frac{16}{24} \leq x < \frac{51}{24} \longrightarrow \boxed{\frac{2}{3} \leq x < \frac{17}{8}}$$

$2/3$

1.6) Inequalities Involving Abs. Value

(15) Isolate and Rewrite (if possible) (but do not solve)

$2 - |2x| = 1$ Isolate!

$+2 \quad -2$

$-|2x| = -1$

$* -1$ (or divide) $* -1$

$|2x| = 1$

$2x = 1 \qquad 2x = -1$ Rewrite!

Stop However, the homework will ask you to solve

$|x+1| = -4$

No Solution

19) $\left|\frac{9x-5}{5x-4}\right| = 0$

$\frac{9x-5}{5x-4} = 0$

$\frac{9x-5}{5x-4} = \frac{0}{1}$

$(9x-5)(1) = (5x-4)(0)$

$9x - 5 = 0$

$+5 \quad +5$

$\frac{9x}{9} = \frac{5}{9}$

$x = 5/9$

14) Solve

$|2x-7| = -\frac{1}{5}$

Negative

No Solution!

Inequalities involving Abs. Value

$-|2x-3| \geq -7$

$-1 \quad -1$

$|2x-3| \leq 7$

$> \text{ or } \geq$ drop

$< \text{ or } \leq$ combined

$-7 \leq 2x-3 \leq 7$

$+3 \quad +3 \quad +3$

$\frac{-4}{2} \leq \frac{2x}{2} \leq \frac{10}{2}$

$-2 \leq x \leq 5$