

NAME: _____
 Pre Calculus II 3.5 Worksheet # 1

1. $8x - 6 \geq 10$

$8x \geq 16$

$x \geq 2$

$[2, \infty)$

2. $23 - 4u < 3$

$-4u < -20$

$u > 5$

$(5, \infty)$

3. $-3(4w - 1) > -12$

$4w < 4$

$4w < 3$

$w < \frac{3}{4}$

$(-\infty, \frac{3}{4})$

4. $5(2x + 3) \leq 4$

$2x + 3 \leq \frac{4}{5}$

$2x < -\frac{11}{5}$

$x < -\frac{11}{10}$

$(-\infty, -\frac{11}{10})$

5. $9x - 11 > 4x + 12$

$5x > 23$

$x > \frac{23}{5}$

$(\frac{23}{5}, \infty)$

6. $1 + 5(x - 8) \leq 2 - (x + 5)$

$5x - 40 \leq 1 - x - 5$

$6x \leq 36$

$x \leq 6$

$(-\infty, 6]$

Ex 1: Can the sum of a number and that number raised to the sixth ever be negative?

$n + n^6 < 0$
 $n(n^5 + 1) < 0$
 $n = -1, 0$

$\leftarrow \frac{1}{-1} \quad \frac{1}{0}$

$(-1, 0)$

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3.7 WS #1

Pre Calc II

Solve each inequality. Make a sign chart for each. Write the solution in interval notation and graph on the number line.

1. $(x-2)(x-5) > 0$

$(-)(-) (+)(+) (+)(-)$

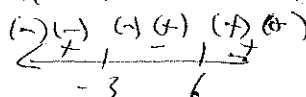


$(-\infty, 2) \cup (5, \infty)$

2. $x^2 - 3x - 18 \geq 0$

$(x-6)(x+3) \geq 0$

$x = 6, -3$



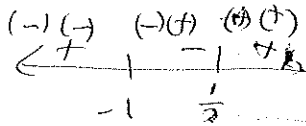
$(-\infty, -3] \cup [6, \infty)$

3. $2x^2 + x \geq 1$

$2x^2 + x - 1 \geq 0$

$(2x-1)(x+1)$

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

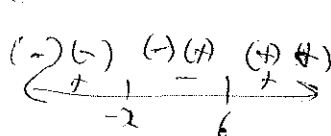


$(-\infty, -1] \cup [\frac{1}{2}, \infty)$

4. $x^2 > 4(x+3)$

$x^2 - 4x - 12 > 0$

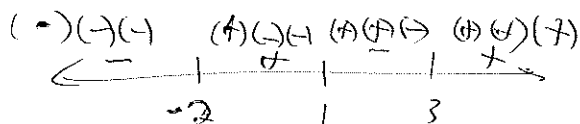
$(x-6)(x+2) > 0$



$(-\infty, -2) \cup (6, \infty)$

5. $(x+2)(x-1)(x-3) \leq 0$

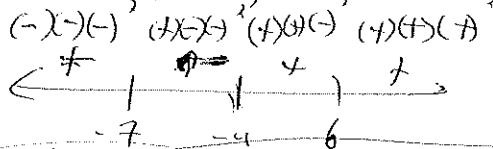
$x = -2, 1, 3$



$(-\infty, -2] \cup [1, 3]$

6. $(x+7)(x+4)(x-6)^2 \geq 0$

$x = -7, -4, 6$

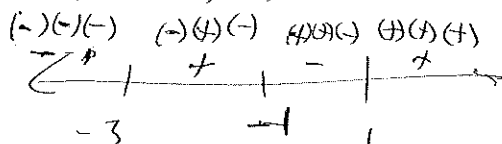


$(-\infty, -7] \cup [-4, \infty)$

7. $(x+1)(x^2 - 3x + 2) < 0$

$(x+1)(x+3)(x-1)$

$x = -1, -3, 1$

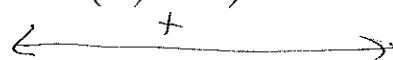


$(-\infty, -3) \cup (-1, 1)$

8. $(x^2 + 4)(2x^2 + 3) < 0$

NO ZEROS

$(+)(+)$



$\{ \}$

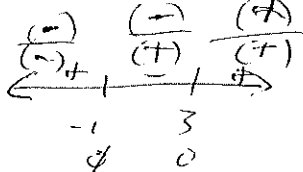
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3.7 WS #2

Pre Calc II

Solve each inequality. Make a sign chart for each. Write the solution in interval notation. If applicable, find a common denominator to combine as one fraction.

1. $\frac{x-3}{x+1} \geq 0$

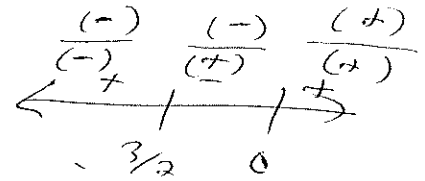
$x = -1, 3$
c



$(-\infty, -1) \cup [3, \infty)$

2. $\frac{4x}{2x+3} > 0$

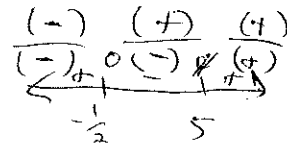
$x = -3/2, 0$



$(-\infty, -3/2) \cup (0, \infty)$

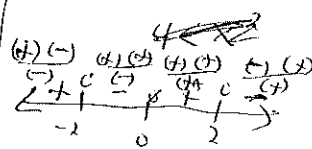
3. $\frac{2x+1}{x-5} \leq 0$

$x = -1/2, 5$
c



$[-1/2, 5)$

4. $\frac{4}{x} < x$



$(-2, 0) \cup (2, \infty)$

$\frac{4}{x} - x < 0$

$\frac{4}{x} - \frac{x^2}{x} < 0$

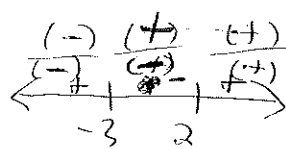
$\frac{4-x^2}{x} < 0$

$\frac{(2-x)(2+x)}{x} < 0$

$x = 2, -2$
 $x \neq 0$

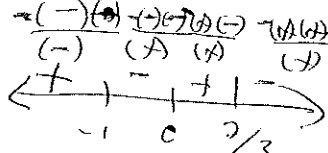
5. $\frac{2x+6}{x-2} \leq 0$

$x = -3, x \neq 2$



$[-3, 2)$

6. $\frac{x}{x+1} > 3x$



$(-\infty, -1) \cup (0, 2/3)$

$\frac{x}{x+1} - 3x > 0$

$\frac{x}{x+1} - \frac{3x(x+1)}{x+1} > 0$

$\frac{x-3x^2-3x}{x+1} > 0$

$\frac{-3x^2-2x}{x+1} > 0$

$\frac{-x(3x+2)}{x+1} > 0$

$x = 0, -2/3, x \neq -1$

$$7. \frac{3+x}{3-x} \geq 1$$

$$\frac{3+x}{3-x} - 1 \geq 0$$

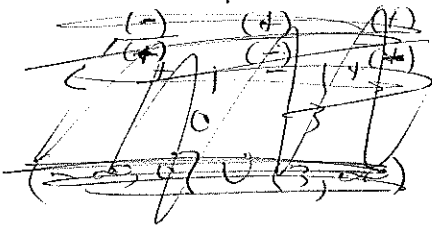
$$\frac{3+x}{3-x} - \frac{(3-x)}{(3-x)} \geq 0$$

$$\frac{3+x-3+x}{3-x} \geq 0 \quad \leftarrow \begin{array}{c} (-) \quad (+) \quad (+) \\ (+) \quad (+) \quad (-) \end{array}$$

$$\frac{2x}{3-x} \geq 0$$

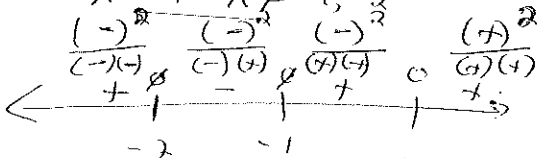
$$\boxed{[0, 3)}$$

$$x=0 \quad x \neq 3$$



$$9. \frac{(x-1)^2}{(x+1)(x+2)} > 0$$

$$x=1 \quad x \neq -1, -2$$



$$\boxed{(-\infty, -2) \cup (-1, 1) \cup (1, \infty)}$$

$$8. \frac{x}{x+2} > \frac{1}{x}$$

$$\frac{x}{x+2} - \frac{1}{x} > 0$$

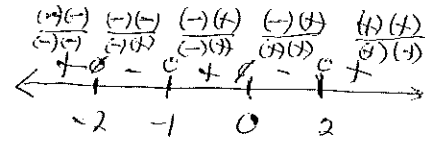
$$\frac{x^2 - (x+2)}{x(x+2)} > 0 \quad \leftarrow \begin{array}{c} (-) \quad (-) \quad (-) \quad (-) \quad (-) \quad (-) \\ (-) \quad (-) \quad (-) \quad (-) \quad (-) \quad (-) \end{array}$$

$$\frac{x^2 - x - 2}{x(x+2)} > 0$$

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

$$x=2, -1$$

$$x \neq 0, -2$$



$$10. \frac{1}{x} + \frac{1}{x+1} < \frac{2}{x+2}$$

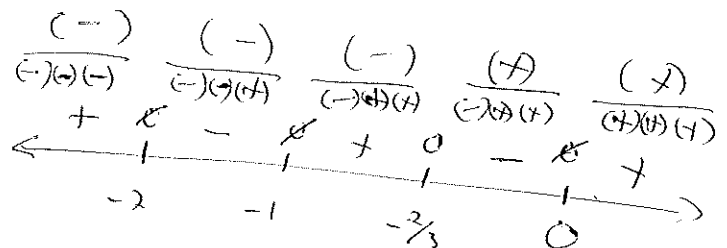
$$\frac{1}{x} + \frac{1}{x+1} - \frac{2}{x+2} < 0$$

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

$$\frac{x^2 + 3x + 2 + x^2 + 2x - 2x^2 - 2x}{x(x+1)(x+2)} < 0$$

$$\frac{3x+2}{x(x+1)(x+2)} < 0$$

$$x \neq -\frac{2}{3} \quad x \neq 0, -1, -2$$



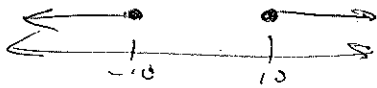
$$\boxed{(-2, -1) \cup (-\frac{2}{3}, 0)}$$

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3.9 WS

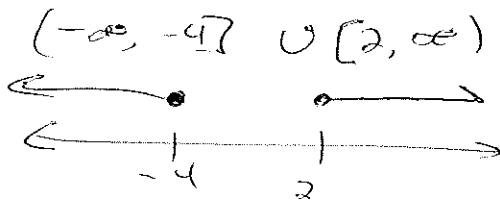
Pre Calc II

Solve each inequality. Write the solution in Interval Notation. Graph the solution set.

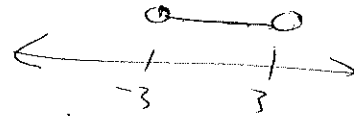
1. $|x| \geq 10$ $x \geq 10$ or $x \leq -10$
 $(-\infty, -10] \cup [10, \infty)$



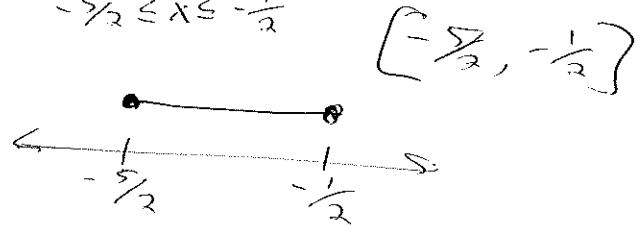
3. $|x+1| \geq 3$ $x+1 \geq 3$ or $x+1 \leq -3$
 $x \geq 2$ or $x \leq -4$



2. $|x| < 3$ $-3 < x < 3$
 $(-3, 3)$



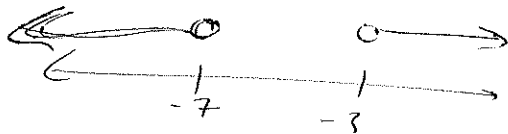
4. $5|2x+3| \leq 10$ $|2x+3| \leq 2$
 $-2 \leq 2x+3 \leq 2$
 $-5 \leq 2x \leq -1$
 $-\frac{5}{2} \leq x \leq -\frac{1}{2}$



5. $|x+5| > 2$

$x+5 < -2$ or $x+5 > 2$
 $x < -7$ or $x > -3$

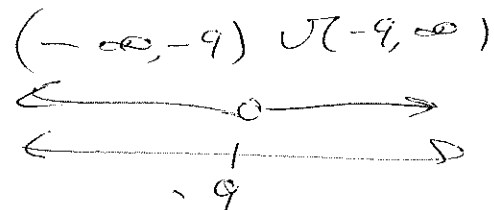
$(-\infty, -7) \cup (-3, \infty)$



6. $|x+9|+9 > 9$

$|x+9| > 0$

$x+9 > 0$ or $x+9 < 0$
 $x > -9$ or $x < -9$



7. $2|2x-5| < 0$

$|2x-5| < 0$

$0 < 2x-5 < 0$

$5 < 2x < 5$

$\frac{5}{2} < x < \frac{5}{2}$

$\{ \}$



8. $\frac{1}{|x+7|} \geq 2$ $x \neq -7$

$1 \geq 2|x+7|$

$\frac{1}{2} \geq |x+7|$

$-\frac{1}{2} \leq x+7 \leq \frac{1}{2}$

$-\frac{15}{2} \leq x \leq -\frac{13}{2}$

$[-\frac{15}{2}, -\frac{13}{2}]$

