4) $\{y \mid y \le -1/12\}$

12) $\{x \mid -5 < x \le 3\}$

20) $\{x \mid -1 \le x < 2\}$

22) $\{x \mid 7/4 < x \le 13/6\}$

28) $\{x \mid x \le -3 \text{ or } x \ge -7/5\}$

44) $\{x \mid -17/3 < x < 3\}$

48} $\{x \mid x < -5/2 \text{ or } x > 15/2\}$

54) {}

Sep 20-2:50 PM

22) $\frac{2}{3} \le -\frac{4}{5}(x-3) < 1$

AND

$\left(\frac{2}{3} \le -\frac{4}{5}(x-3)\right)15$

$10 \le -12(x-3)$

$10 \le -12x + 36$

$-36 \qquad -36$

$\frac{-26}{-12} \le \frac{-12x}{-12}$

$\frac{13}{6} \ge x$

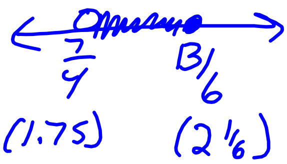
$x \le \frac{13}{6}$

$\left(-\frac{4}{5}(x-3) < 1\right)5$

$-4x + 12 < 5$

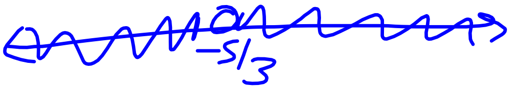
$\frac{-4x}{-4} < \frac{-7}{-4}$

$x > \frac{7}{4}$



54) $|3x+5| < 0$ AND

| | |
|---|---|
| $3x+5 < 0$ | $-3x-5 < 0$ |
| $x < -5/3$ | $x > -5/3$ |




Absolute value is never negative.

$| m | < 0$

$\{ \}$ or $\emptyset$

From Text:

Pg 249 – 250: 58, 65, 66

58) Invest \$12,000. Let $x$ = part at 4% → $.04x$

$12000 - x$ = part at 6% → $.06(12000-x)$

$$.04x + .06(12000-x) \geq 650$$

$$.04x + 720 - .06x \geq 650$$

$$-.02x \geq -70$$

$$x \leq 3500$$ , $x$ = part at 4%.

The most she can invest at 4% and be guarenteed at least \$650 in annual interest is \$3500.

From Text, pg 250

do together in class

62. *Income Plans.* Karen can be paid in one of two ways for selling insurance policies:

Plan A: A salary of \$750 per month, plus a commission of 10% of sales; $A(X) = 750 + .10X$

Plan B: A salary of \$1000 per month, plus a commission of 8% of sales in excess of \$2000

$B(x) = 1000 + .08(x-2000)$

For what ~~amount of~~ monthly sales is plan A better than plan B if we can assume that sales are always more than \$2000?

Plan A > plan B

Let x = amount of monthly sales

$A(x) > B(x)$

$A(x) - B(x) > 0$

$750 + .10x - [1000 + .08(x-2000)] > 0$

$750 + .10x - 1000 - .08(x-2000) > 0$

$-250 + .10x - .08x + 160 > 0$

$-90 + .02x > 0$

$.02x > 90$

$x > 4500$

when sales are greater than \$4500 Plan A is better than plan B.

Sep 20-2:50 PM

63. *Income Plans.* Curt can be paid in one of two ways for the furniture he sells:

Plan A: A salary of \$900 per month, plus a commission of 10% of sales;

Plan B: A salary of \$1200 per month, plus a commission of 15% of sales in excess of \$8000

For what amount of monthly sales is plan B better than ~~plan A~~ if we can assume that Curt's sales are always more than \$8000?

Plan A: $y = 900 + .1x$

Plan B: $y = 1200 + .15(x - 8000)$

$1200 + .15x - 1200x \geq 900 + .1x$

$.05x \geq 900$

$x \geq 18000$

Sales of \$18,000 or more plan B is better

Sep 20-2:52 PM

Solve for x. Show all work as demonstrated in class. Include number line graphs when required.

1. $x(x+1)\left(\dfrac{5}{x^2+x} = \dfrac{x+4}{x} + \dfrac{1}{x^2+x}\right)$ $x \neq 0, -1$

$5 = (x+1)(x+4) + 1$

$5 = x^2 + 5x + 5$

$x^2 + 5x = 0$

$x(x+5) = 0$ $\{-5\}$

$x = 0$ $x = -5$

2. $x(x+2)\left(1 = \dfrac{1}{x^2+2x} + \dfrac{x-1}{x}\right)$ $x \neq 0, -2$

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

$x^2 + 2x = 1 + x^2 + x - 2$

$x = -1$

$\{-1\}$

Sep 20-2:53 PM

3. $(x-3)^2 = \left(\sqrt{30-2x}\right)^2$

$x^2 - 6x + 9 = 30 - 2x$

$x^2 - 4x - 21 = 0$ $\{7\}$

$(x-7)(x+3) = 0$

$x = 7$ $x = -3$

✓ $7 - 3 = \sqrt{30-14}$ $-3-3 = \sqrt{30+6}$

$4 = \sqrt{16}$ $-6 = \sqrt{36}$

$4 \stackrel{\checkmark}{=} 4$ $-6 \neq 6$

4. $\sqrt{3x+4} - \sqrt{2x+1} = 1$

$\left(\sqrt{3x+4}\right)^2 = \left(\sqrt{2x+1} + 1\right)^2$

$3x + 4 = 2x + 1 + 2\sqrt{2x+1} + 1$

$(x+2)^2 = \left(2\sqrt{2x+1}\right)^2$

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

$x^2 - 4x = 0$ $\{0, 4\}$

$x(x-4) = 0$

$x = 0$ $x = 4$

$\sqrt{0+4} - \sqrt{0+1} = 1$ $\sqrt{12+4} - \sqrt{8+1} = 1$

$2 - 1 = 1$ $4 - 3 = 1$

$1 \stackrel{\checkmark}{=} 1$ $1 \stackrel{\checkmark}{=} 1$

Sep 20-2:53 PM

5. $9 + 2x < 7$ or $7 - 5x \le -8$

$2x < -2$ | $-5x \le -15$

$x < -1$ | $x \ge 3$


$\{x \mid x < -1 \text{ or } x \ge 3\}$

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

6. $5x + 10 \le -4x - 17 < 9 - 2x$

$5x + 10 \le -4x - 17$ And $-4x - 17 < 9 - 2x$

$9x \le -27$ $-2x < 26$

$x \le -3$ $x > -13$


$\{x \mid -13 < x \le -3\}$

OR $(-13, -3]$

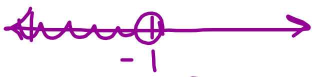
Sep 20-2:53 PM

7. $-\frac{2}{3}(7x - 2) > 6$

$-14x + 4 > 18$

$-14x > 14$

$x < -1$




$\{x \mid x < -1\}$

or $(-\infty, -1)$

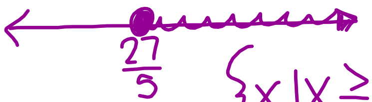
8. $-\frac{1}{3}(5x - 9) + 4 \le -2$

$-\frac{1}{3}(5x - 9) \le -6$

$5x - 9 \ge 18$

$5x \ge 27$

$x \ge \frac{27}{5}$




$\{x \mid x \ge \frac{27}{5}\}$

$[\frac{27}{5}, \infty)$

Sep 20-2:53 PM

9. $4|6-2x|+8 \le 24$

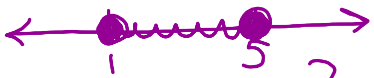
$$4|6-2x| \le 16$$

$$|6-2x| \le 4$$

$6-2x \le 4$ | $-6+2x \le 4$

$-2x \le -2$ | $2x \le 10$

$x \ge 1$ | $x \le 5$




$\{x \mid 1 \le x \le 5\}$

or $[1,5]$

10. $|2x+5|-6 \ge -5$

$$|2x+5| \ge 1$$

$2x+5 \ge 1$ | $-2x-5 \ge 1$

$2x \ge -4$ | $-2x \ge 6$

$x \ge -2$ | $x \le -3$


$\{x \mid x \le -3 \text{ or } x \ge -2\}$

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



11. $|1-4x| \ge -3$

$(-\infty,\infty)$

or

$\{x \mid x \in \mathbb{R}\}$

12. $7\left|\frac{x}{3}\right|-9<12$

$$7\left|\frac{x}{3}\right| < 21$$

$$\left|\frac{x}{3}\right| < 3$$

$\frac{x}{3} < 3$ | $-\frac{x}{3} < 3$

$x < 9$ | $x > -9$


$\{x \mid -9 < x < 9\}$

OR $(-9,9)$

Oct 10-9:37 AM