Name: key

Math 433—Pulford

Date: _____

HW 5

Solve the following equations/inequalities and graph your solution set on a number line.

1.

$6 - 4|6a - 4| = -26$

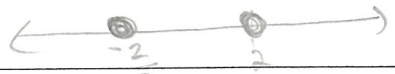
$-4|6a-4| = -32$

$|6a-4| = 8$

$6a-4=8$ or $6a-4=-8$

$6a=12$ $\quad 6a=-4$

$a=2$ or $a=-\frac{2}{3}$

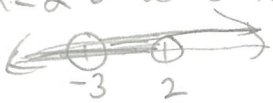


2.

$3 < 5 - x < 8$ or $-3x < 0$

$3<5-x$ and $5-x<8$ or $x>0$

$x<2$ and $-3<x$



$-3<x<2$ or $x>0$

$x>-3$

3.

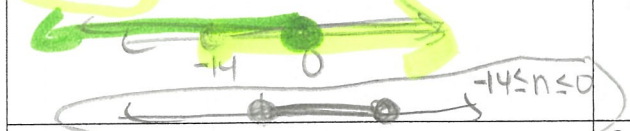
$7|-7-n| + 5 \le 54$

$7|-7-n| \le 49$

$|-7-n| \le 7$

$-7-n \le 7$ AND $-7-n \ge -7$

$-14 \le n$ AND $0 \ge n$



$-14 \le n \le 0$

4.

$-\frac{1}{2}|4-x| + 1 = x + 3$

$-\frac{1}{2}|4-x| = x+2$

$|4-x| = -2x-4$

$4-x=-2x-4$ or $-(4-x)=-2x-4$

$x=-8$ or $-4+x=-2x-4$

$3x=0$

$x=0$

reject

ck: $x=0$

$-\frac{1}{2}|4|+1=3$

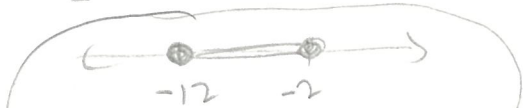
$-1 \neq 3$

5.

$-8 + n \le 2n + 4 \le n + 2$

$-8+n \le 2n+4$ and $2n+4 \le n+2$

$-12 \le n$ and $n \le -2$



$-12 \le n \le -2$

6.

$\left[-3 < \frac{3x-1}{5} < \frac{1}{2}\right]$ and $\left[\frac{1}{3} < \frac{3-2x}{6} < \frac{9}{2}\right]$

$-30 < 2(3x-1) < 5$

$-30 < 6x-2 < 5$

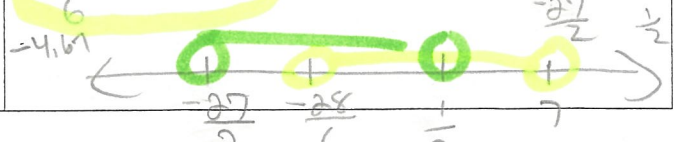
$-28 < 6x < 7$

$-\frac{28}{6} < x < 7$ AND

$2 < 3-2x < 18$

$-1 < -2x < 27$

$\frac{1}{2} > x > -\frac{27}{2}$



overlap

$-\frac{28}{6} < x < \frac{1}{2}$

Simplify completely. There should only be positive exponents in your answer.

7.

$$\left(\frac{3m^2n^7}{m}\right)^5$$

$$\frac{3^5 m^{10} n^{35}}{m^5}$$

$$2^4 3 m^5 n^{35}$$

8.

$$6x^0y^8 - (2y^2)^4$$

$$6y^8 - (2^4 y^8)$$

$$6y^8 - 16y^8$$

$$-10y^8$$

9.

$$\frac{-48c^2d^4}{-8cd}$$

$$6cd^3$$

10.

$$\left(\frac{-2a^3b^2c^0}{3a^2b^3c^7}\right)^{-2}$$

$$\frac{(-2)^{-2}a^{-6}b^{-4}}{3^{-2}a^{-4}b^{-6}c^{-14}}$$

$$\frac{9a^4b^6c^{14}}{4a^6b^4}$$

$$\frac{9b^2c^{14}}{4a^2}$$

Set up an equation or inequality to solve. Remember to include a let statement.

11.

Higher education. The formulas

$$B = 16.45n + 980.20$$

and

$$M = 7.79n + 287.87$$

can be used to approximate the number of bachelor's and master's degrees in thousands, respectively, awarded in the year $1985 + n$ (National Center for Education Statistics, www.nces.ed.gov).

a) How many bachelor's degrees were awarded in 1995?

b) In what year will the number of bachelor's degrees that are awarded reach 1.26 million?

c) What is the first year in which both B is greater than 1.3 million and M is greater than 0.5 million?

a) plug in 10 for n in B(n)

$n = 10$ (1144.7)

b) $1,260 = 16.45n + 980.20$

$279.8 = 16.45n$

$17.009 = n$

2002 is the year that 1.26 million Bachelor's degrees are awarded

c) $16.45n + 980.2 > 1300$

$16.45n > 319.8$

$n > 19.44$ and

and

$7.79n + 287.87 > 500$

$n > 27.23$

$n > 27.23$

In 2013, B will be greater than 1.3 million and M is greater than .5 million.

12.

Weighted average. Professor Jorgenson gives only a midterm exam and a final exam. The semester average is computed by taking $\frac{1}{3}$ of the midterm exam score plus $\frac{2}{3}$ of the final exam score. The grade is determined from the semester average by using the grading scale given in the table. If Stanley scored only 56 on the midterm, then for what range of scores on the final exam would he get a C or better in the course?

Grading	Scale
90–100	A
80–89	B
70–79	C
60–69	D

Let x be Stanley's grade on the final

$\frac{1}{3}(56) + \frac{2}{3}x \geq 70$

$56 + 2x \geq 210$

$x \geq 77$

Stanley can receive between a 77 and 100 on the final exam to receive at least a C.