Key

Math 125 Test 1 Name: _____

Show all necessary steps clearly, neatly, systematically to receive full credit.

1. Solve: $\frac{1}{5}|4-3x|-2=1$.

$\frac{1}{5}|4-3x| = 3$

$|4-3x| = 15$

$4-3x = 15$ or $4-3x = -15$

$-3x = 11$ $-3x = -19$

$x = \frac{11}{-3}$ $x = \frac{-19}{-3}$

$x = \frac{19}{3}$

$\left\{-\frac{11}{3}, \frac{19}{3}\right\}$

2. Solve: $-\frac{7}{5}x > 14$ and $13-2x \geq 15$. Write the solution set in interval notation and graph.

intersection

$x < 14 \cdot \left(-\frac{5}{7}\right)$ $-2x \geq 2$

$x < -10$ $x \leq -1$

i) $(-\infty, -10)$

ii)

side

intersection

3. Solve: $-|x+6|+11 \le 10$. Write the solution set in set-builder notation and graph.

$-|x+6| \le -1$

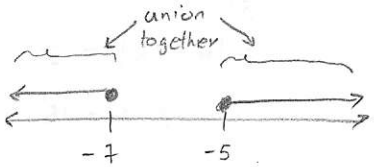
$|x+6| \ge 1$

$x+6 \ge 1$ or $x+6 \le -1$

$x \ge -5$ $\quad$ $x \le -7$

side

union together



i) $\{x \mid x \le -7 \text{ or } x \ge -5\}$

ii)

4. Solve: $-2 \le 3 - \frac{2}{3}x < 2$. Write the solution set in interval notation and set-builder notation.

$-5 \le -\frac{2}{3}x < -1$

$-15 \le -2x < -3$

$\frac{-15}{-2} \ge x > \frac{-3}{-2}$

$\frac{15}{2} \ge x > \frac{3}{2}$

$\frac{3}{2} < x \le \frac{15}{2}$

i) $\left(\frac{3}{2}, \frac{15}{2}\right]$

ii) $\left\{x \mid \frac{3}{2} < x \le \frac{15}{2}\right\}$

5. Solve: $\frac{3}{4}+\frac{1}{4}x-\frac{3}{5}x<\frac{5}{6}+\frac{1}{2}\left(x-\frac{2}{3}\right)$. Write the solution set in interval notation and graph.

$$\frac{3}{4}+\frac{1}{4}x-\frac{3}{5}x<\frac{5}{6}+\frac{1}{2}x-\frac{1}{3}$$

$$60\left(\frac{3}{4}+\frac{1}{4}x-\frac{3}{5}x\right)<\left(\frac{5}{6}+\frac{1}{2}x-\frac{1}{3}\right)\cdot 60$$

$$45+15x-36x<50+30x-20$$

$$45-21x<30+30x$$

$$45<30+51x$$

$$15<51x$$

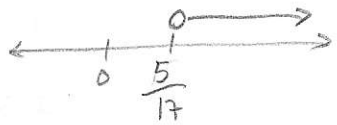
$$\frac{15}{51}<x$$

or

$$x>\frac{5}{17}$$

i) $\left(\frac{5}{17},\infty\right)$

ii)



6. Solve: $|x-7|=|11-2x|$.

$$x-7=11-2x$$

$$3x-7=11$$

$$3x=18$$

$$x=6$$

or

$$x-7=-(11-2x)$$

$$x-7=-11+2x$$

$$-7=-11+x$$

$$4=x$$

$\{4, 6\}$

7. Solve: $\frac{2x+1}{2}-\frac{x+1}{5}=\frac{3x+1}{4}-\frac{7x-4}{2}$.

$20.\left(\frac{2x+1}{2}-\frac{x+1}{5}\right)=\left(\frac{3x+1}{4}-\frac{7x-4}{2}\right).20$

$10(2x+1)-4(x+1)=5(3x+1)-10(7x-4)$

$20x+10-4x-4=15x+5-70x+40$

$16x+6=-55x+45$

$71x+6=45$

$71x=39$

$x=\frac{39}{71}$

$\left\{\frac{39}{71}\right\}$

8. Solve: $0.9(z-3)-0.2(z-5)=0.4(z+1)+0.3z-2.1$.

$0.9z-2.7-0.2z+1=0.4z+0.4+0.3z-2.1$

$0.7z-1.7=0.7z-1.7$

$-1.7=-1.7$ ← True

$\{\mathbb{R}\}$

9. Solve: $Y = C + bY + I + G + N$ for Y.

$$Y - bY = C + I + G + N$$

$$Y(1 - b) = C + I + G + N$$

$$Y = \frac{C + I + G + N}{1 - b}$$

10. To help move his furniture, a man rents a truck for \$41.50 per day plus 35 cent per mile. If he has budgeted \$15 for transportation expenses, how many miles will he be able to drive the truck if the move takes one day? (*make sure to show in 3-step format*)

① # of miles = x

② $41.50 + 0.35x = 15$

11. The measure of the second angle is 15 degrees more than the measure of the first angle. The measure of the third angle is 45 degrees more than the measure of the first angle. Find the measures of the interior angles in the triangle. (*make sure to show in 3-step format*)

① measure of $\angle 1 = x$
" $\angle 2 = x + 15$
" $\angle 3 = x + 45$

② $x + (x+15) + (x+45) = 180$

$3x + 60 = 180$

$3x = 120$

$x = 40$

③ measure of $\angle 1 = 40$
" $\angle 2 = 55$
" $\angle 3 = 85$

12. A carpenter wants to put four shelves on an 8-foot wall so that the five spaces created decrease by 6 inches as we move up the wall. If the thickness of each shelf is ¾ inch, how far will the bottom shelf be from the floor? (*make sure to show in 3-step format*)

① measure of 1st space (bottom) = x
" 2nd " $= x - 6$
" 3rd $= x - 12$
" 4th $= x - 18$
" 5th $= x - 24$

② $x + (x-6) + (x-12) + (x-18) + (x-24) + 4 \cdot \frac{3}{4} = 8 \cdot 12$

$5x - 60 + 3 = 96$

$5x - 57 = 96$

$5x = 153$

$x = 30.6$

③ measure of 1st space (bottom) = 30.6 in