Show all necessary steps Clearly, Neatly, and Systematically to receive full credit. Any incorrect statement will be penalized.

1. Solve: $2[-(x-1)+4]=5+[-(6x-7)+9x]$.

$$2[-x+1+4]=5+[-6x+7+9x]$$
$$2[-x+5]=5+[3x+7]$$
$$-2x+10=5+3x+7$$
$$-2x+10=3x+12$$
$$-2=5x$$
$$-\frac{2}{5}=x$$
$$\left\{-\frac{2}{5}\right\}_{//}$$

2. Solve: $au+bv=ax-by$ for a.

$$au-ax=-by-bv$$
$$a(u-x)=-by-bv$$
$$a=\frac{-by-bv}{u-x} \quad //$$

alt

$$bv+by=ax-au$$
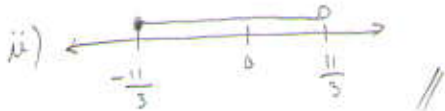$$bv+by=a(x-u)$$
$$\frac{bv+by}{x-u}=a \quad //$$

3. Solve: $-3 \le \dfrac{3x}{4} + \dfrac{1}{4} < 3$. Write the solution set in interval notation and graph.

$$-12 \le 3x + 1 < 12$$

$$-13 \le 3x < 11$$

$$\dfrac{-13}{3} \le x < \dfrac{11}{3}$$

i) $\left[-\dfrac{13}{3}, \dfrac{11}{3} \right)$

ii)

4. Solve: $-2|4-5x| + 9 > 7$. Write the solution set in interval notation.

$$-2|4-5x| > -2$$

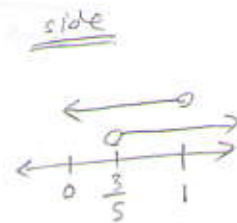$$|4-5x| < 1$$

$4 - 5x < 1$ and $-(4-5x) < 1$

$-5x < -3$ $\qquad -4 + 5x < 1$

$x > \dfrac{3}{5}$ $\qquad\qquad 5x < 5$

$\qquad\qquad\qquad x < 1$

side

$$\left(\dfrac{3}{5}, 1 \right)$$

5. Evaluate: $\dfrac{7y-5x}{2w}$ for $w=\dfrac{2}{3}$, $x=-\dfrac{1}{14}$, $y=\dfrac{1}{9}$.

$$\frac{7y-5x}{2w} = \frac{7\left(\frac{1}{9}\right)-5\left(-\frac{1}{14}\right)}{2\left(\frac{2}{3}\right)}$$

$$= \frac{\frac{7}{9}+\frac{5}{14}}{\frac{4}{3}} \cdot \frac{126}{126}$$

$$= \frac{98+45}{168}$$

$$= \frac{143}{168} \; /\!/$$

6. Solve: $-\dfrac{11}{13}x > -22$ and $3x+2 \geq -7$. Write the solution set in interval notation and set-builder notation.

intersection

$x < -22 \cdot -\dfrac{13}{11}$ $3x \geq -9$

$x < 26$ $x \geq -3$

i) $[-3, 26)$

ii) $\{x \mid -3 \leq x < 26\}$

side
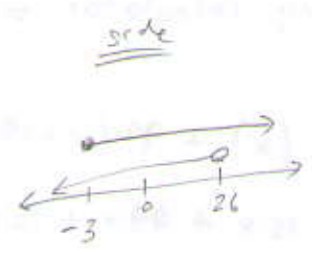
7. Solve: $C = \dfrac{5}{9}(F - 32)$ for F.

$$C = \frac{5}{9}F - \frac{160}{9}$$

$$9C = 5F - 160$$

$$9C + 160 = 5F$$

$$\frac{9C + 160}{5} = F$$

$$\frac{9}{5}C + \frac{160}{5} = F$$

$$\frac{9}{5}C + 32 = F \,//$$

alt

$$\frac{9}{5} \cdot C = \frac{9}{5} \cdot \frac{5}{9}(F - 32)$$

$$\frac{9}{5}C = F - 32$$

$$\frac{9}{5}C + 32 = F \,//$$

8. Last month, a book store ran the following ad, $12 for scientific calculator and $99 for graphing calculator. Sale of $5370 were generated, with 15 more graphing calculator sold than scientific calculators. How many of each type of calculator did the bookstore sell? (*make sure to set up in 3-steps format.*)

# of scientific calculator = x
# of graphing calculator = x + 15

$$12(x) + 99(x + 15) = 5370$$

$$12x + 99x + 1485 = 5370$$

$$111x + 1485 = 5370$$

$$111x = 3885$$

$$x = 35$$

35 scientific calculator and 50 graphing calculator //

side

$$\begin{array}{r} 99 \\ \times\ 15 \\ \hline 495 \\ 990 \\ \hline 1485 \end{array}$$

$$\begin{array}{r} 5370 \\ -1485 \\ \hline 3885 \end{array}$$

9. Solve: $|3x+1| = |2x+4|$.

$3x+1 = 2x+4$ or $3x+1 = -(2x+4)$

$x+1 = 4$ $3x+1 = -2x-4$

$x = 3$ $5x+1 = -4$

$5x = -5$

$x = -1$

$$\{-1, 3\}$$

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

$$10\left(\frac{2x+5}{5} - \frac{-x+7}{2}\right) = \left(\frac{3x+1}{2}\right)10$$

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

$4x+10+5x-35 = 15x+5$

$9x-25 = 15x+5$

$-25 = 6x+5$

$-30 = 6x$

$-5 = x$

$$\{-5\}$$

11. Solve: $-\dfrac{1}{5}\left|\dfrac{2}{3}x+\dfrac{1}{6}\right|-\dfrac{5}{3}<\dfrac{2}{3}$.

$$-\dfrac{1}{5}\left|\dfrac{2}{3}x+\dfrac{1}{6}\right|<\dfrac{7}{3}$$

$$\left|\dfrac{2}{3}x+\dfrac{1}{6}\right|>\dfrac{7}{3}\cdot-\dfrac{5}{1}$$

$$\left|\dfrac{2}{3}x+\dfrac{1}{6}\right|>-\dfrac{35}{3}$$

$$(-\infty,\infty)\,/\!/$$

12. When it is assembled, a flute is 29 inches long. The middle piece is 4 inches less than twice as long as the first piece. The last piece is two-thirds as long as the first piece. Find the length of each piece of the flute. (*make sure to set up in 3-steps format.*)

① 1st piece $= x$

middle piece $= 2x-4$

last piece $= \dfrac{2}{3}x$

② $x+(2x-4)+\dfrac{2}{3}x=29$

$$3x+6x-12+2x=87$$

$$11x-12=87$$

$$11x=99$$

$$x=9$$

③   first piece is 9 in, middle piece is 14 in, last piece is 6 in $/\!/$