

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

1. Solve: $7[2 - (3 + 4x)] - 2x = -9 + 2(1 - 15x)$.

$$7[2 - 3 - 4x] - 2x = -9 + 2 - 30x$$

$$7[-1 - 4x] - 2x = -7 - 30x$$

$$-7 - 28x - 2x = -7 - 30x$$

$$-7 - 30x = -7 - 30x$$

$$-7 = -7$$

$$\{ \mathbb{R} \} //$$

2. Perform indicated operations:

$$-3 \left(\frac{-5 - (-9)}{-2 \cdot 3 - 1} \right) - \sqrt{(-5)^2 - 3^2}$$

$$\frac{|-9 - (-7)| - |-5 - (-8)|}{-3 \cdot \left(\frac{4}{-7} \right) - \sqrt{25 - 9}}$$

$$\frac{\frac{12}{7} - 4}{2 - 3}$$

$$\frac{-\frac{16}{7}}{-1}$$

$$\frac{16}{7} //$$

3. Solve: $\frac{3}{4}(x-2) - \frac{1}{5}(x-8) > -\frac{1}{2}$. Write the solution set in interval notation and graph.

$$\frac{3}{4}x - \frac{3}{2} - \frac{1}{5}x + \frac{8}{5} > -\frac{1}{2}$$

$$20\left(\frac{3}{4}x - \frac{3}{2} - \frac{1}{5}x + \frac{8}{5}\right) > \left(-\frac{1}{2}\right) \cdot 20$$

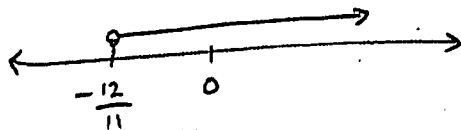
$$15x - 30 - 4x + 32 > -10$$

$$11x + 2 > -10$$

$$11x > -12$$

$$x > -\frac{12}{11}$$

$$\left(-\frac{12}{11}, \infty\right)$$



4. Solve: $13|14-15x| - 16 > 10$. Write the solution set in interval notation.

$$13|14-15x| > 26$$

$$|14-15x| > 2$$

$$14-15x > 2 \quad \text{or} \quad 14-15x < -2$$

$$-15x > -12$$

$$-15x < -16$$

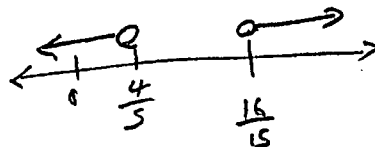
$$x < \frac{-12}{-15}$$

$$x > \frac{-16}{-15}$$

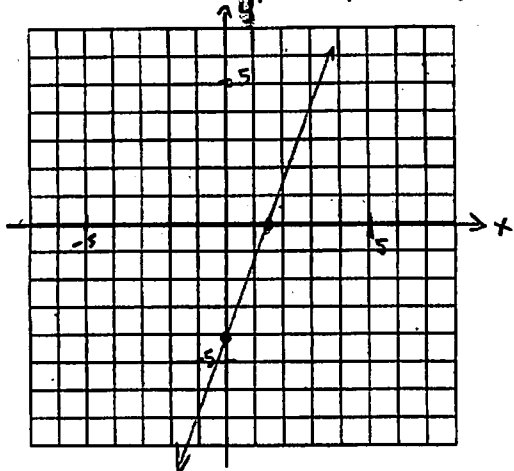
$$x < \frac{4}{5}$$

$$x > \frac{16}{15}$$

$$\left(-\infty, \frac{4}{5}\right) \cup \left(\frac{16}{15}, \infty\right)$$



5. Find x-intercept and y-intercept of the equation: $\frac{2}{3}x - \frac{1}{4}y = 1$. Then graph.



x	y	
0	-4	y-intercept
$\frac{3}{2}$	0	x-intercept

$$\frac{2}{3}(0) - \frac{1}{4}y = 1$$

$$-\frac{1}{4}y = 1$$

$$y = -4$$

$$\frac{2}{3}x - \frac{1}{4}(0) = 1$$

$$\frac{2}{3}x = 1$$

$$x = \frac{3}{2}$$

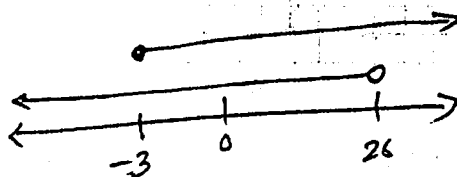
6. Solve: $-\frac{11}{13}x > -22$ or $3x + 2 \geq -7$. Write the solution set in interval notation and set-builder notation.

$$x < -\frac{22}{1} \cdot -\frac{13}{11} \quad 3x \geq -9$$

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

$$(-\infty, \infty)$$

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



7. Solve: $a = \frac{a+b+c}{d}$ for a .

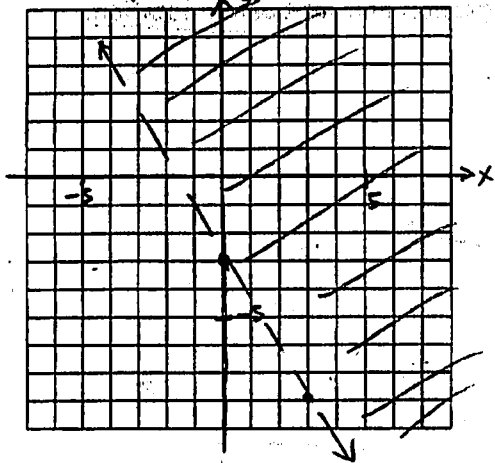
$$ad = a+b+c$$

$$ad - a = b+c$$

$$a(d-1) = b+c$$

$$a = \frac{b+c}{d-1} //$$

8. Graph the solution set of the linear inequality: $-5x - 3y < 9$.



$$-3y < 5x + 9$$

$$y > \frac{5}{-3}x + \frac{9}{-3}$$

$$y > -\frac{5}{3}x - 3$$

Test

Pick $(0, 0)$

$$-5(0) - 3(0) < 9$$

$$0 < 9$$

↑
True

9. Solve: $\left| \frac{2}{3}x - 2 \right| = \left| \frac{1}{3}x + 3 \right|$.

$$\frac{2}{3}x - 2 = \frac{1}{3}x + 3 \quad \text{or} \quad \frac{2}{3}x - 2 = -\left(\frac{1}{3}x + 3\right)$$

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

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

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

$$x - 2 = -3$$

$$x = 15$$

$$x = -1$$

$$\{-1, 15\} //$$

10. Solve: $\frac{4x+1}{3} - \frac{x-3}{6} = \frac{x+5}{6}$.

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

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

$$8x + 2 - x + 3 = x + 5$$

$$7x + 5 = x + 5$$

$$6x + 5 = 5$$

$$6x = 0$$

$$x = 0$$

$$\{0\} //$$

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

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

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

$$\left| \frac{2}{3}x + \frac{1}{6} \right| < -10$$

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12. To start training for a triathlon, an athlete runs 8 times longer than she swims, and cycles 45 miles longer than she runs. If she covers a overall distance of 70.5 miles, find the length of each part of her workout. (Make sure to show in 3 steps format)

① length of running = $8x$
length of swimming = x
length of cycling = $8x + 45$

② $8x + x + 8x + 45 = 70.5$

$$17x + 45 = 70.5$$

$$17x = 25.5$$

$$x = \frac{25.5}{17}$$

$$x = 1.5$$

③ run 12 miles, swim 1.5 miles, and cycle 57 miles. //