(9) $\frac{7}{5}(10x+5)-3=\frac{2}{5}(10x-20)+4$

REDO

$\frac{7}{5}(10x)+\frac{7}{5}(5)-3=\frac{2}{5}(10x)-\frac{20}{5}(\frac{2}{5})+4$

$14x+7-3=4x-8+4$

$14x+4=4x-4$

$-4x \qquad -4x$

$10x+4=-4$

$-4 \quad -4$

$\frac{10x}{10}=\frac{-8}{10}$

$x=-\frac{4}{5}$

(11) $h = vt + 16t^2$

$-16t^2 \qquad -16t^2$

$$\frac{h - 16t^2}{t} = \frac{vt}{t}$$

$$\frac{h - 16t^2}{t} = v$$

$$\frac{h}{t} - 16t = v$$

T

\+ plus sign

t t

$\frac{2x}{2} = \frac{4}{2}$

$x = 2$

(14) $4 - 8x < 13 + 3x$

$-3x \qquad -3x$

$4 - 11x < 13$

$-4 \qquad -4$

$\frac{-11x}{-11} < \frac{9}{-11}$

$x > -\frac{9}{11}$

$\left(-\frac{9}{11}, \infty\right)$

$\not\emptyset$

$x \geq -\frac{2}{5}$ $\quad \left[-\frac{2}{5}, \infty\right)$

large without bound

$y - y_1 = m(x - x_1)$ point-slope form

(x_1, y_1)

m = slope

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

x_1, y_1

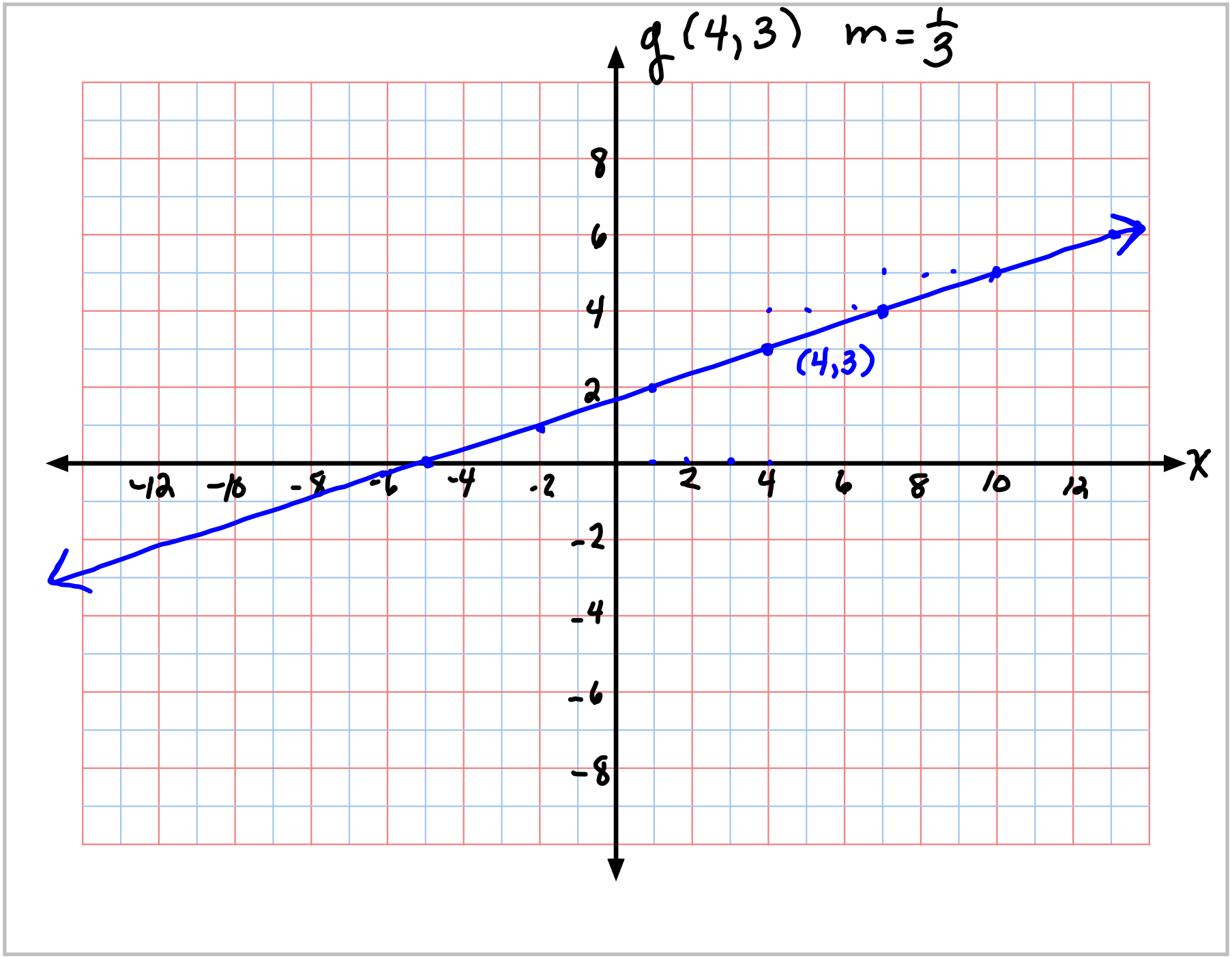
$(4, 3)$

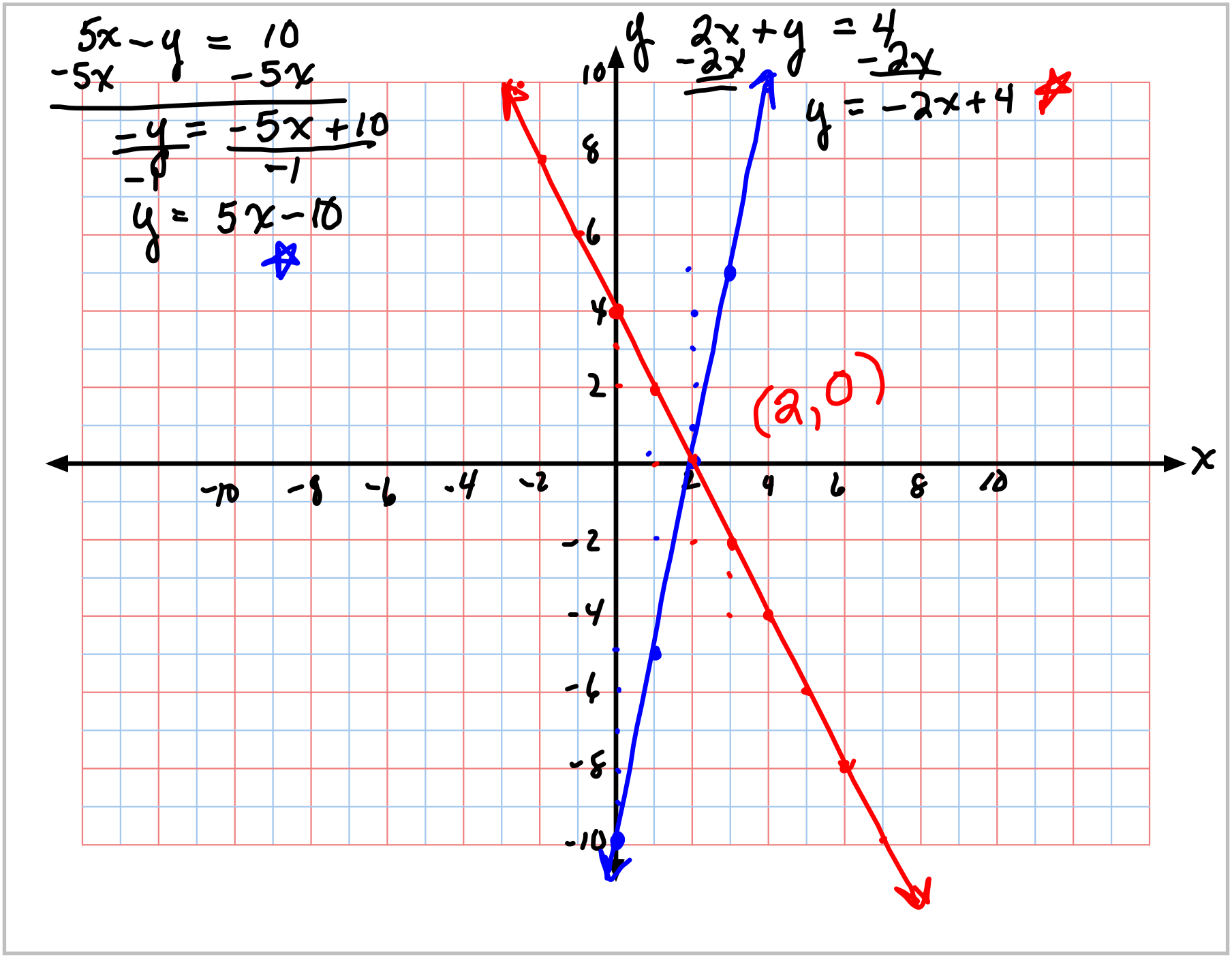
$m = \frac{1}{3}$

$y + 3 = 2(x + 6)$

$(-6, -3)$

$m = 2$


g(4,3) m = 1/3
(4,3)
X
8
6
4
2
-2
-4
-6
-8
-12
-10
-8
-6
-4
-2
2
4
6
8
10
12


5x − y = 10
−5x −5x
−y = −5x + 10
−1 −1
y = 5x − 10
y 2x + y = 4
−2x −2x
y = −2x + 4
(2, 0)
x
10
8
6
4
2
−2
−4
−6
−8
−10
−10 −8 −6 −4 −2 2 4 6 8 10

4.2 The Elimination Method (addition)

Addition property of equality

A, B, C expressions

$A = B$

$A + C = B + C$

Include D

$A = B$

$C = D$

$A + C = B + D$ → true

(1x)

$$\begin{array}{r} x + y = -2 \\ x - y = 6 \\ \hline 2x = 4 \end{array}$$

(+y and −y: zero)

$$\frac{2x}{2} = \frac{4}{2}$$

$$x = 2$$

We can substitute this into either of the equations to get

$$\begin{array}{r} x + y = -2 \\ 2 + y = -2 \\ -2 \quad -2 \\ \hline y = -4 \end{array}$$

$$\begin{array}{r} x - y = 6 \\ 2 - y = 6 \\ -2 \quad -2 \\ \hline -y = 4 \\ \frac{-y}{-1} = \frac{4}{-1} \\ y = -4 \end{array}$$

Solution $(2, -4)$ point

Not so simple

(4) $4(4x - y = -1) \rightarrow 16x - 4y = -4$

$2x + 4y = 13 \rightarrow 2x + 4y = 13$

$2\left(\frac{1}{2}\right) + 4y = 13$

$1 + 4y = 13$

$-1 \quad -1$

$4y = 12$

$\frac{4y}{4} = \frac{12}{4}$

$y = 3$

$18x = 9$

$\frac{18x}{18} = \frac{9}{18}$

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

Solution

$\left(\frac{1}{2}, 3\right)$

(ex)

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

$$0 + 0 = 0$$

$0 = 0$ true

They are the same line

there are infinite # of solutions

(ex) $8x - 2y = 2$

$-2(4x - y = 2) \rightarrow$

$8x - 2y = 2$

$-8x + 2y = -4$

$0 + 0 = -2$

$0 = -2$

false

no solutions

(20) $\begin{aligned} -x + 10y &= 1 \\ -5x + 15y &= -9 \end{aligned}$ (-5)

$$\begin{aligned} 5x - 50y &= -5 \\ -5x + 15y &= -9 \end{aligned}$$

$$0 - 35y = -14$$

$$\frac{-35y}{-35} = \frac{-14}{-35}$$

$$y = -\frac{2}{5}$$

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

$$-x - 4 = 1$$

$$+4 \quad +4$$

$$-x = 5$$

$$\frac{-x}{-1} = \frac{5}{-1}$$

$$x = -5$$

Solution $\left(-5, -\frac{2}{5}\right)$ point

(32) $\left(\frac{7}{12}x - \frac{1}{2}y = \frac{1}{6}\right)12 \rightarrow (7x - 6y = 2)5$

$\left(\frac{2}{5}x - \frac{1}{3}y = \frac{11}{15}\right)15 \cdot \quad (6x - 5y = 11)-6$

$\downarrow$

$35x - 30y = 10$

$-36x + 30y = -66$

$\frac{-x}{-1} = \frac{-56}{-1}$

$x = 56$

$6(56) - 5y = 11$

$336 - 5y = 11$

$-336 \quad -336$

$\frac{-5y}{-5} = \frac{-325}{-5}$

$y = 65$

$(56, 65)$

4.3 3rd method

Substitution method

(ex) $x - y = -3$

$y = 3x + 5$

$y = 3(-1) + 5$

$= -3 + 5$

$= 2$

$x - (3x + 5) = -3$

$x - 3x - 5 = -3$

$-2x - 5 = -3$

$+5 \quad +5$

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

$x = -1$

Solution $(-1, 2)$

(ex) $2x - 2y = 2$

$x - 3y = -7$

$+3y \quad +3y$

$x = 3y - 7$

puts in other equation

$2(3y-7) - 2y = 2$

$6y - 14 - 2y = 2$

$4y - 14 = 2$

$+14 \quad +14$

$\frac{4y}{4} = \frac{16}{4}$

$y = 4$

$x = 3(4) - 7$

$x = 12 - 7$

$x = 5$

Solution

$(5, 4)$

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

$x + 2y = 8$

$-2y \quad -2y$

$x = 8 - 2y$

$x - 2y = -2$

Put into other

$2(8-2y) - 4y = -4$

$16 - 4y - 4y = -4$

$16 - 8y = -4$

$-16 \quad -16$

$\frac{-8y}{-8} = \frac{-20}{-8}$

$y = \frac{5}{2}$

$2(x) - 4\left(\frac{5}{2}\right) = -4$

$2x - 10 = -4$

$+10 \quad +10$

$\frac{2x}{2} = \frac{6}{2}$

$x = 3$

$\left(3, \frac{5}{2}\right)$