7) \[ 3x - 5y = -7 \]
\[ x - 4y = -7 \]

a) \((1, 2)\) are these coordinates a solution to the system?

b) \((-\frac{2}{3}, 1)\)

**to be a solution, must satisfy all equations in the system.**

a) \[ 3(1) - 5(2) = 3 - 10 = -7 \] ✔ yes
\[ (1) - 4(2) = 1 - 8 = -7 \] ✔

b) \[ 3(-\frac{2}{3}) - 5(1) = -2 - 5 = -7 \] ✔
\[ \frac{-2}{3} - 4(1) = \frac{-2}{3} - \frac{12}{3} = \frac{-14}{3} \neq -7 \] ✗

15) \[ x + 3y = 5 \] solve using substitution method.
\[ 3x - 2y = -18 \]

- **Plug x into 2nd equation:**
  - \[ x = 5 - 3y \]
  - \[ 3(5 - 3y) - 2y = -18 \]
  - \[ 15 - 9y - 2y = -18 \]
  - \[ -11y = -18 - 15 \]
  - \[ -11y = -33 \]
  - \[ y = 3 \]

- **Plug y into first equation:**
  - \[ x = 5 - 3(3) \]
  - \[ x = 5 - 9 \]
  - \[ x = -4 \]

Answer: \((4, 3)\)
Solve System using Sub.

20) \[5(x+y) = 9 + 2y\]
\[6y - 2 = 10 - 7x\]
\[5x + 5y - 2y = 9\]
\[5x + 3y = 9\]
\[7x + 6y = 12\]
\[7x + 6\left(3 - \frac{5}{3}x\right) = 12\]
\[7x + 18 - \frac{30}{3}x = 12\]
\[7x - 10x = 12 - 18\]
\[-3x = -6\]
\[x = 2\]
\[y = 3 - \frac{5}{3}(2)\]
\[y = -1\frac{1}{3}\]

Answer: \(\left(2, -1\frac{1}{3}\right)\)

Plug coordinate into your original system to double check your answer.

Elimination by addition method

22) \[5x - 2y = -2\]
\[3x + 4y = 30\]

Want to add one equation to another and eliminate one of your variables.

\[2(5x - 2y) = 2(-2)\]
\[+ 3x + 4y = 30\]
\[10x - 4y = -4\]
\[13x \quad = 26\]
\[x = 2\]

Plug into 2nd:
\[3(2) + 4y = 30\]
\[4y = 24\]
\[y = 6\]

Answer: \((2, 6)\)
(28) \[ 3x - 4y = 9 \]
\[ 2x + 9y = 2 \]
\[ 2(3x - 4y) = 2(9) \]
\[ -3(2x + 9y) = 3(2) \]
\[ 6x - 8y = 18 \]
\[ -6x - 27y = -18 \]
\[ 3x - 4y = 9 \]
\[ 6x = 27 \]
\[ x = 4.5 \]
\[ 3x + 48 = 9 \]
\[ 105x = 267 \]
\[ x = \frac{267}{105} \]
\[ 105x + 48 = 315 \]
\[ 105 \]
\[ \frac{89}{55} \]

Answer:
\[ \left( \frac{89}{55}, -\frac{12}{35} \right) \]

Yuck!

\[ \frac{x+1}{2} - \frac{y-2}{10} = -1 \]
\[ \frac{x+1}{6} + \frac{y-2}{2} = 2.1 \]

\[ 5x + 5 - y + 2 = -10 \]
\[ x + 1 + 3y - 6 = 12.6 \]

\[ 5x - y = -17 \]
\[ x + 3y = 131 \]
3. From handout

\[5m + 2v = 16\]
\[3m + 8v = 47\]

Find \(m\) and \(v\).

\[-4(5m + 2v) = -4(16)\]
\[-20m - 8v = -64\]
\[-\frac{\text{20}}{8} \cdot -8v = -64\]
\[-3m + 8v = 47\]
\[-17m = -17\]
\[m = 1\]

\[3(1) + 8v = 47\]
\[8v = 44\]
\[v = \frac{11}{2} \text{ or } 5.50\]