

KEY

**Instructions:** Show all work. Use exact answers unless specifically asked to round. Reduce as much as possible. Be sure to answer all parts of each question.

1. Solve the system of equations  $\begin{cases} 4x + y = 11 \\ 2x - 6y = 30 \end{cases}$  by substitution. State whether the system is consistent or inconsistent, and if applicable, dependent or independent.

$$y = -4x + 11$$

$$2x - 6(-4x + 11) = 30$$

$$2x + 24x - 66 = 30$$

$$\begin{array}{r} 26x - 66 = 30 \\ + 66 \quad + 66 \\ \hline \end{array}$$

$$\frac{26x}{26} = \frac{96}{26}$$

$$x = \frac{48}{13}$$

$$y = -4\left(\frac{48}{13}\right) + 11$$

$$y = -\frac{49}{13}$$

$$\boxed{\left(\frac{48}{13}, -\frac{49}{13}\right)}$$

consistent and independent

2. Solve the system of equations  $\begin{cases} 3x + 4y = 20 \\ 5x - 7y = 35 \end{cases}$  by using elimination by addition. State whether the system is consistent or inconsistent, and if applicable, dependent or independent.

$$21x + 28y = 140$$

$$20x - 28y = 140$$

$$\frac{41x}{41} = \frac{280}{41}$$

$$x = \frac{280}{41}$$

$$5\left(\frac{280}{41}\right) - 7y = 35$$

$$5\left(\frac{280}{41}\right) - 35 = 7y$$

$$\frac{-35}{7} = \frac{7y}{7}$$

$$y = -\frac{5}{41}$$

$$\boxed{\left(\frac{280}{41}, -\frac{5}{41}\right)}$$

consistent & independent

3. Solve the system of equations  $\begin{cases} 2x - 4y = 6 \\ -4x + 8y = 22 \end{cases}$  by any method. State whether the system is consistent or inconsistent, and if applicable, dependent or independent. If you use the graphing method, sketch the graph obtained from the calculator in lieu of showing algebra work.

$$4x - 8y = 12$$

$$-4x + 8y = 22$$

$$0 = 34$$

contradiction

this system is inconsistent

a graph yields two parallel lines