

## Systems of Equations; $1/x + 1/y$

### Procedure:

1. Solve by linear combination
2. Make the numerators the same on one variable by multiplying
3. Add the equations together
4. Solve the resulting equation
5. Substitute that value into one of the equations to find the value of the other variable.

### Example:

$$\frac{10}{x} - \frac{9}{y} = 8$$

$$\frac{8}{x} + \frac{15}{y} = -1$$

Multiply 1<sup>st</sup> equation by 5, the 2<sup>nd</sup> equation by 3

$$\frac{50}{x} - \frac{45}{y} = 40$$

$$\frac{24}{x} + \frac{45}{y} = -3$$

Adding the equations together  $\frac{74}{x} = 37$

Cross multiplying,  $37x = 74$ , or  $x = 2$

Substituting  $x = 2$  in 1<sup>st</sup> equation,  $5 - \frac{9}{y} = 8$  or  $y = -3$

1. 
$$\frac{4}{x} + \frac{9}{y} = 5$$
$$\frac{8}{x} - \frac{3}{y} = 3$$

2. 
$$\frac{12}{x} - \frac{6}{y} = -1$$
$$\frac{9}{x} + \frac{10}{y} = -8$$

3. 
$$\frac{4}{x} + \frac{3}{y} = 7$$
$$\frac{10}{x} - \frac{5}{y} = -\frac{15}{2}$$

4. 
$$\frac{5}{x} - \frac{8}{y} = 1$$
$$\frac{3}{x} + \frac{2}{y} = -13$$

5. 
$$2y - \frac{1}{x} = \frac{7}{6}$$
$$3y + \frac{4}{x} = -1$$

6. 
$$\frac{1}{2m} - \frac{3}{n} = -\frac{13}{4}$$
$$\frac{1}{m} + \frac{2}{n} = \frac{25}{6}$$

Hint – Mult 1<sup>st</sup> equation by 4.