

$$\frac{3}{x} + \frac{4}{y} = \frac{5}{2}$$

$$\frac{-5}{x} + \frac{3}{y} = \frac{-7}{4}$$

1) Multiply the first equation by 3 to get:  $\frac{9}{x} + \frac{12}{y} = \frac{15}{2}$

2) Multiply the second equation by -4:  $\frac{20}{x} - \frac{12}{y} = \frac{28}{4}$

3) Add the equations together to get rid of  $\frac{12}{y}$  and  $\frac{-12}{y}$ :  $\frac{9}{x} + \frac{12}{y} + \frac{20}{x} - \frac{12}{y} = \frac{15}{2} + \frac{28}{4}$

4) Simplify the left side :

$$\frac{9}{x} + \frac{20}{x} = \frac{30}{4} + \frac{28}{4}$$

5) Add the left side fractions, and the right side fractions:

$$\frac{29}{x} = \frac{58}{4}$$

6) Cross multiply:

$$4 \cdot 29 = 58 \cdot x$$

7) Divide both sides by 58:

$$\frac{116}{58} = x \quad \text{so } x=2.$$

8) Once you know  $x$  is 2, you get  $y$  from plugging into the first equation, for example:  $\frac{3}{2} + \frac{4}{y} = \frac{5}{2}$

9) At this point, subtract  $\frac{3}{2}$  from both sides, and solve for  $y$ :

$$\frac{4}{y} = \frac{5}{2} - \frac{3}{2}$$

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

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

$$4=y$$

10) So the point that solves the system is  $(2,4)$ .