

p. 156 #7

$$\begin{cases} x + 3y = 7 \\ 2x - 4y = 24 \end{cases}$$

SUBSTITUTION method

$$x + 3y = 7$$

$$x = 7 - 3y$$

$$2(7 - 3y) - 4y = 24$$

$$14 - 6y - 4y = 24$$

$$x = 7 - 3(-1) \quad 14 - 10y = 24$$

$$= 7 + 3$$

$$-10y = 10$$

$$x = 10$$

$$\begin{aligned} x &= 10 \\ y &= -1 \end{aligned}$$

$$y = -1$$

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g      \$1

f      \$5

how many of each?

$$f + g = 15 \quad \text{Total \# bills}$$

$$5f + g = 47 \quad \text{Total \# \$}$$

$$f + g = 15$$

$$f = 15 - g$$

$$5(15 - g) + g = 47$$

$$75 - 4g = 47$$

$$4g = 28$$

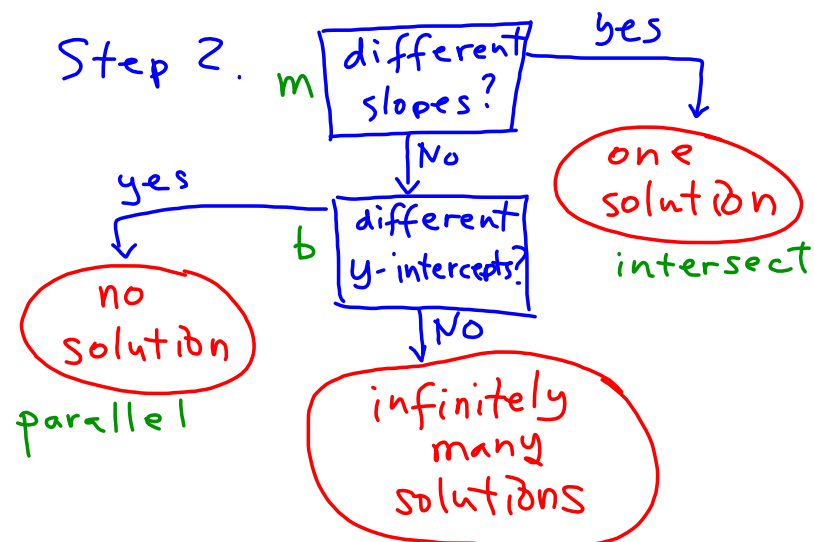
$$g = 7$$

Topic: finding number of solutions quickly without calculator (graphing)

step 1. Put equations in slope - intercept ( $y = mx + b$ ) form

Danger! equation is

$$x = -2 \quad m = \infty \quad (\text{undefined})$$



"coincident"  
(lines sit right on top of each other)

Example :

$$\begin{cases} 2x + 3y = 1 \\ 4x + y = -3 \end{cases}$$

How many solutions?

1.  $2x + 3y = 1$        $4x + y = -3$   
 $3y = -2x + 1$        $y = -4x - 3$   
 $\frac{3y}{3} = \frac{-2x + 1}{3}$        $m = -4$   
 $y = -\frac{2x}{3} + \frac{1}{3}$        $b = -3$   
 $y = -\frac{2}{3}x + \frac{1}{3}$       2. **one solution**  
 $m = -\frac{2}{3}$        $b = \frac{1}{3}$