

11-10-17 1st Tr. 9

Find x if

$$x + y = 8 \quad \text{and} \quad y = 3$$

$$x + 3 = 8$$

$$x = 5$$

$$\textcircled{1} \begin{cases} y = 2x + 1 \\ x + y = 7 \end{cases}$$

$$x + 2x + 1 = 7$$

$$3x + 1 = 7$$

$$\begin{array}{r} -1 \quad -1 \\ \hline 3x = 6 \end{array}$$

$$x = 2$$

$$y = 2 \cdot 2 + 1 = 5$$

$$\textcircled{2} \begin{cases} y = x - 4 \\ x + 2y = 14 \end{cases}$$

$$x + 2(x - 4) = 14$$

$$x + 2x - 8 = 14$$

$$3x - 8 = 14$$

$$\begin{array}{r} +8 \quad +8 \\ \hline 3x = 22 \end{array}$$

$$\frac{3x}{3} = \frac{22}{3}$$

$$x = 7\frac{1}{3}$$

$$y = 7\frac{1}{3} - 4$$

$$y = 3\frac{1}{3}$$

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

$$x - (2x + 4) = -7$$

$$x - 2x - 4 = -7$$

$$-x - 4 = -7$$

$$\begin{array}{r} -x - 4 = -7 \\ +4 \quad +4 \\ \hline -x = -3 \end{array}$$

$$-x = -3$$

$$x = 3$$

$$y = 2(3) + 4$$

$$y = 10$$

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

$$2x + 1 = 3x - 4$$

$$\begin{array}{r} 2x + 1 = 3x - 4 \\ -2x \quad -2x \\ \hline 1 = x - 4 \end{array}$$

$$1 = x - 4$$

$$\begin{array}{r} 1 = x - 4 \\ +4 \quad +4 \\ \hline 5 = x \end{array}$$

$$5 = x$$

$$y = 2 \cdot 5 + 1$$

$$y = 11$$

$$\textcircled{5} \begin{cases} y = 2x + 3 \\ y - 2x = 7 \end{cases}$$

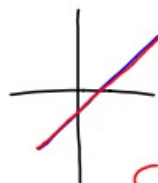
$$2x + 3 - 2x = 7$$

$$3 = 7 \quad \text{FALSE}$$

\therefore No solution

because they
are parallel

What if I had a true
solution like $3 = 3$?



Same line

so $\in \mathbb{R}$

Coincident lines

11-10-17 3rd Trig

Find x if you know

$$x + y = 10 \quad \text{and} \quad y = 8.$$

$$x = 2$$

$$\textcircled{1} \begin{cases} y = x + 7 \\ x + y = 13 \end{cases}$$

$$x + x + 7 = 13$$

$$2x + 7 = 13$$

$$\begin{array}{r} -7 \quad -7 \\ \hline 2x = 6 \end{array}$$

$$2x = 6$$

$$x = 3$$

$$y = 3 + 7 = 10$$

$$\textcircled{2} \begin{cases} y = 3x - 1 \\ 2x + 2y = 14 \end{cases}$$

$$2x + 2(3x - 1) = 14$$

$$2x + 6x - 2 = 14$$

$$8x - 2 = 14$$

$$x = 2$$

$$y = 3 \cdot 2 - 1 \\ = 5$$

$$\begin{aligned}
 \textcircled{3} \quad \left\{ \begin{array}{l} y = 2x - 5 \\ x - y = 2 \end{array} \right. \\
 x - (2x - 5) = 2 \\
 x - 2x + 5 = 2 \\
 -x + 5 = 2 \\
 \begin{array}{r} -x + 5 = 2 \\ \quad \quad \quad -5 \quad -5 \\ \hline -x = -3 \end{array} \\
 x = 3 \qquad y = 2 \cdot 3 - 5 \\
 \qquad \qquad \qquad = 1
 \end{aligned}$$

$$\begin{aligned}
 \textcircled{4} \quad \left\{ \begin{array}{l} y = 3x + 1 \\ x - y = -3 \end{array} \right. \\
 x - (3x + 1) = -3 \\
 x - 3x - 1 = -3 \\
 -2x - 1 = -3 \\
 \begin{array}{r} -2x - 1 = -3 \\ \quad \quad \quad +1 \quad +1 \\ \hline -2x = -2 \\ x = 1 \end{array} \\
 y = 3 \cdot 1 + 1 \\
 y = 4
 \end{aligned}$$

$$\begin{aligned}
 \textcircled{5} \quad \left\{ \begin{array}{l} y = 3x - 1 \\ y = 2x + 7 \end{array} \right. \\
 3x - 1 = 2x + 7 \\
 \begin{array}{r} 3x - 1 = 2x + 7 \\ -2x \quad \quad -2x \\ \hline x - 1 = 7 \\ \quad \quad \quad +1 \quad +1 \\ \hline x = 8 \end{array} \\
 y = 2 \cdot 8 + 7 = 23
 \end{aligned}$$

$$\textcircled{6} \begin{cases} y = -3x + 1 \\ y + 3x = 7 \end{cases}$$

$$-3x + 1 + 3x = 7$$

$$1 = 7 \quad \text{FALSE}$$

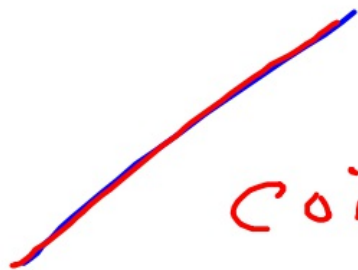
\therefore No Solution
because lines are
parallel.

..

$\textcircled{7}$ If had true statement like

$$5 = 5, \text{ then } \mathbb{R}$$

infinite # of
solutions



Coincident lines

11-10-17 4th Try

Can you find x if

I tell you

$$x + y = 8 \quad \text{and } y = 5?$$

$$x + 5 = 8$$

$$x = 3$$

$$\textcircled{1} \quad \left\{ \begin{array}{l} y = x + 4 \\ x + y = 14 \end{array} \right.$$

$$x + x + 4 = 14$$

$$2x + 4 = 14$$

$$\begin{array}{r} -4 \quad -4 \\ \hline 2x = 10 \end{array}$$

$$x = 5$$

$$y = 5 + 4 = 9$$

$$\textcircled{2} \quad \left\{ \begin{array}{l} y = 2x + 4 \\ x + 2y = 13 \end{array} \right.$$

$$x + 2(2x + 4) = 13$$

$$x + 4x + 8 = 13$$

$$\begin{array}{r} -8 \quad -8 \\ \hline 5x = 5 \end{array}$$

$$x = 1$$

$$y = 2 \cdot 1 + 4 = 6$$

$$\textcircled{3} \begin{cases} y = x - 8 \\ 3x - y = 26 \end{cases}$$

$$3x - (x - 8) = 26$$

$$3x - x + 8 = 26$$

$$2x + 8 = 26$$

$$\begin{array}{r} 2x + 8 = 26 \\ -8 \quad -8 \\ \hline 2x = 18 \end{array}$$

$$x = 9 \quad y = 9 - 8 = 1$$

$$\textcircled{4} \begin{cases} y = 3x - 1 \\ y = x + 5 \end{cases}$$

$$3x - 1 = x + 5$$

$$\begin{array}{r} 3x - 1 = x + 5 \\ -x \quad -x \\ \hline 2x - 1 = 5 \end{array}$$

$$\begin{array}{r} 2x - 1 = 5 \\ +1 \quad +1 \\ \hline 2x = 6 \end{array}$$

$$2x = 6$$

$$x = 3 \quad y = 3 + 5 = 8$$

$$\textcircled{5} \begin{cases} y = 2x - 1 \\ 2y - 4x = 7 \end{cases}$$

$$2(2x - 1) - 4x = 7$$

$$4x - 2 - 4x = 7$$

$$-2 = 7 \quad \text{FALSE}$$

\therefore No solution
because lines
are parallel

What third situation could
occur?

they are the same line

 Coincident lines

means all real #s
are solutions

(infinite # solutions)

This will happen if

you get a

TRUE statement

like $3 = 3$.

$$\textcircled{6} \begin{cases} y = x - 4 \\ 2x - 2y = 8 \end{cases}$$

$$2x - 2(x - 4) = 8$$

$$2x - 2x + 8 = 8$$

$$8 = 8 \quad \text{TRUE}$$

infinite # solutions