Solutions ICP 10/20/15

① this type of system has exactly one solution - consistent & Independent

② this type of system can have (0,0) as A solution consistent & Independent

③ this type of system has NO solutions (Parallel lines) means Inconsistent

④ This type of system has every point on the lines as a solution Consistent & Dependent

⑤ this type of system is hardest to depict

(6) $m_1 = \frac{2}{1}$ $b_1 = 0$ $\boxed{y = 2x + 0}$

$m_2 = \frac{2}{1}$ $b_2 = 2$ $\boxed{y = 2x + 2}$

this is an inconsistent linear system

(7) $m_1 = \frac{2}{1}$ $b_1 = 0$ $\boxed{y = 2x + 0}$

$m_2 = \frac{-2}{1}$ $b_2 = 2$ $\boxed{y = -2x + 2}$

this is a consistent independent systems

(8) $m_1 = \frac{2}{1}$ $b_1 = 0$ $\boxed{y = 2x + 0}$

$m_2 = \frac{-2}{3}$ $b_2 = 2$ $\boxed{y = \frac{-2}{3}x + 2}$

this is a consistent independent system

(9) $m_1 = \frac{-2}{3}$ $b_1 = 2$ $\boxed{y = \frac{-2}{3}x + 2}$

$m_2 = \frac{-2}{5}$ $b_2 = -3$ $\boxed{y = -\frac{2}{5}x - 3}$

this is a consistent independent system

(10) $m_1 = \frac{-2}{1}$ $b_1 = 4$ $\boxed{y = -2x + 4}$

$m_2 = \frac{3}{1}$ $b_2 = 1$ $\boxed{y = 3x + 1}$

this is a consistent independent system

(11) $m_1 = \frac{-1}{4}$ $b_1 = 2$ $\boxed{y = \frac{-1}{4}x + 2}$

$m_2 = \frac{5}{4}$ $b_2 = -4$ $\boxed{y = \frac{5}{4}x - 4}$

this is a consistent independent system

Solutions ICP 10/20/15

(12) $y = -\frac{2}{3}x + 2$

$6x + 15y = -45$

$\boxed{\text{Part 1}}$

$6x + 15\left(-\frac{2}{3}x + 2\right) = -45$

$6x - 10x + 30 = -45$

$-4x + 30 = -45$

$\quad -30 \quad -30$

$-4x = -75$

$\frac{-4x}{-4} = \frac{-75}{-4}$ $\boxed{x = 18.75}$

Part 2

$y = -\frac{2}{3}(18.75) + 2$

$y = -12.5 + 2$

$\boxed{y = -10.5}$

Solution $(18.75, -10.5)$

✓✓ $6(18.75) + 15(-10.5) = -45$

$112.5 - 157.5 = -45$

$-45 = -45$

(13) Solutions to ICP 10/20/15

$$\left.\begin{aligned} y &= 2x \\ y &= -2x+2 \end{aligned}\right\}$$

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

$$\begin{aligned} 2x &= -2x + 2 \\ +2x & \quad +2x \\ \hline 4x &= 2 \end{aligned}$$

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

$$\boxed{x = 1/2}$$

(2) $y = 2(\frac{1}{2}) = 1$

$$\boxed{y = 1}$$

$$\boxed{\text{Solution}\left(\frac{1}{2}, 1\right)}$$

✓✓ $y = 2(\frac{1}{2}) = 1$ ✓✓

$y = -2(\frac{1}{2}) + 2 = -1 + 2 = 1$ ✓✓

(14) Solutions to ICP 10/20/15

$$\left.\begin{aligned} 4x+6y &= 12 \\ y &= 2x \end{aligned}\right\}$$

① $4x+6(2x)=12$

$4x+12x=12$

$16x=12$

$\frac{16x}{16}=\frac{12}{16}$

$\boxed{x=\frac{3}{4}}$

✓✓ $4(\frac{3}{4})+6(\frac{3}{2})=$

$3+9=12$ ✓✓

✓✓ $y=2(\frac{3}{4})$

$=\frac{6}{4}$

$=\frac{3}{2}$

$=1\frac{1}{2}$

$=1.5$ ✓✓

② $y=2(\frac{3}{4})$

$y=\frac{6}{4}=\frac{3}{2}=1\frac{1}{2}=1.5$

$$\boxed{\begin{matrix}(\frac{3}{4},\frac{3}{2}) \\ (0.75, 1.5)\end{matrix}}$$

(15) Solutions to ICP 10/20/15

$y = -2x + 4$

$y = 3x - 1$

① $-2x + 4 = 3x - 1$

$+2x \qquad +2x$

$4 = 5x - 1$

$4 = 5x - 1$

$+1 \qquad +1$

$\frac{5}{5} = \frac{5x}{5}$

$x = 1$

$y = -2(1) + 4$

$= -2 + 4$

$= 2$

$y = 3(1) - 1$

$= 3 - 1$

$= 2$

② $y = -2(1) + 4$

$= -2 + 4$

$= 2$

$\boxed{(1, 2)}$

(1b) $y = 2x$

$-4.2x + 2.1y = 4.2$

① $-4.2x + 2.1(2x) = 4.2$

$-4.2x + 4.2x = 4.2$

$0 \neq 4.2$

False statement

Mean Parallel

Lines

<u>method ②</u>

$-4.2x + 2.1y = 4.2$

$+4.2x \qquad +4.2x$

$2.1y = 4.2x + 4.2$

$\frac{2.1y}{2.1} = \frac{4.2x}{2.1} + \frac{4.2}{2.1}$

$\boxed{y = 2x + 2}$

$\boxed{\begin{array}{l} y = 2x \\ y = 2x + 2 \end{array}}$

parallel lines

NO Solutions

(17) $\left.\begin{array}{l} y = -\frac{1}{4}x + 2 \\ -5x + 4y = -16 \end{array}\right\}$ (1)

$-5x + 4\left(-\frac{1}{4}x + 2\right) = -16$

$-5x - 1x + 8 = -16$

$-6x + 8 = -16$

$-6x + 8 = -16$
$\quad -8 \quad -8$

$-6x = -24$

$\frac{-6x}{-6} = \frac{-24}{-6}$

$x = 4$

$y = -\frac{1}{4}(4) + 2$

$= -1 + 2$

$\boxed{y = 1}$

$-5(4) + 4(1) = -20 + 4$
$= -16$ ✓

Solutions

$\boxed{(4,1)}$

(18) Solutions to ICP 10/20/15

$$\left.\begin{aligned} y &= -2x+4 \\ -16x-8y &= -32 \end{aligned}\right\}$$

✓✓ $-16x-8y=-32$

$+16x \qquad +16x$

$-8y = 16x-32$

$-8y \quad 16x-32$

$\frac{-8y}{-8} = \frac{16x}{-8} \frac{-32}{-8}$

$\boxed{y=-2x+4}$

(1) $-16x-8(-2x+4)=-32$

$-16x+16x-32=-32$

$\boxed{-32=-32}$

true statements means two copies of same line

$\boxed{\text{consistent \& dependent}}$

since $y=-2x+4$ → $-16x-8y=-32$ same line

(19) Solutions to ±CP

$$\left.\begin{aligned} y &= -2x + 4 \\ -16x - 8y &= 32 \end{aligned}\right\}$$

(1) $-16x - 8(-2x + 4) = 32$

$-16x + 16x - 32 = 32$

$0 - 32 = 32$

$-32 \neq 32$

Since False Statement these are parallel lines

NO Solution-s

✓✓ $-16x - 8y = 32$

$+16x \qquad +16x$

$-8y = 16x + 32$

$\frac{-8y}{-8} = \frac{16x}{-8} + \frac{32}{-8}$

$\boxed{y = -2x - 4}$

$\boxed{\begin{aligned} y &= -2x + 4 \\ y &= -2x + 4 \end{aligned}}$