

(3) by substitution:

$$\begin{cases} x^2 - y^2 = 9 \\ x - y = 1 \end{cases}$$

$$y = x - 1$$

$$x^2 - (x-1)^2 = 9$$

$$x^2 - (x^2 - 2x + 1) = 9$$

$$x^2 - x^2 + 2x - 1 = 9$$

$$2x - 1 = 9$$

$$2x = 10$$

$$x = 5$$

$$y = 5 - 1 = 4$$

$$\boxed{(5, 4)}$$

(13) Business, initial inv. \$10,000, unit cost \$2.85, sell price \$4.95, Break even?

$$C = 10,000 + 2.85x$$

$$R = 4.95x$$

$$C = R \quad 4.95x = 10,000 + 2.85x$$

$$2.1x = 10,000$$

$$x = 4761.9047$$

$$\boxed{4762 \text{ units}}$$

(15) perimeter of rectangle = 480 m
length is 1.5 times width.
Find dimensions.

$$\begin{cases} 2L + 2W = 480 \\ L - 1.5W = 0 \end{cases}$$

$$L = 1.5W$$

$$L - 1.5W = 0$$

$$\begin{cases} L - 1.5W = 0 \\ 2L + 2W = 480 \end{cases}$$

$$\begin{cases} L - 1.5W = 0 \\ 5W = 480 \end{cases}$$

$$5W = 480$$

$$W = 96$$

$$L - 1.5(96) = 0$$

$$L = 144$$

$$\boxed{144 \text{ m} \times 96 \text{ m}}$$

(32) \$46,000 total invested in 6.75%, 7.25%.
interest income \$3245. most in 6.75%?

$$\begin{cases} 10000 \begin{cases} x + y = 46000 \\ .0675x + .0725y = 3245 \end{cases} \end{cases}$$

$$\begin{cases} 675 \begin{cases} x + y = 46000 \\ 675x + 725y = 32450000 \end{cases} \end{cases}$$

$$x + y = 46000$$

$$50y = 1,400,000$$

$$y = \$28,000$$

$$x = \boxed{\$18,000}$$

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$$\begin{cases} x + 3y - z = 13 \\ 2x - 5z = 23 \\ 4x - y - 2z = 14 \end{cases} \quad -17y = -40$$

$$\begin{cases} x + 3y - z = 13 & y = \frac{40}{17} \\ -6y - 3z = -3 & -2\left(\frac{40}{17}\right) - z = -1 \\ 4x - y - 2z = 14 & z = 1 - \frac{80}{17} \end{cases}$$

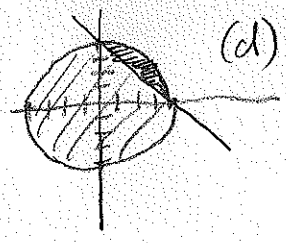
$$\begin{cases} x + 3y - z = 13 & z = \frac{17}{17} - \frac{80}{17} \\ -6y - 3z = -3 & z = -\frac{63}{17} \\ -13y + 2z = -38 & x + 3\left(\frac{40}{17}\right) - \left(-\frac{63}{17}\right) = 13 \end{cases}$$

$$\begin{cases} x + 3y - z = 13 & x = \frac{221}{17} - \frac{120}{17} - \frac{63}{17} \\ -2y - z = -1 & x = \frac{38}{17} \\ -13y + 2z = -38 \end{cases}$$

$$\begin{cases} x + 3y - z = 13 \\ -2y - z = -1 \\ -17y = -40 \end{cases} \quad \boxed{\begin{pmatrix} 38 & 40 & -63 \\ 17 & 17 & 17 \end{pmatrix}}$$

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$$\begin{cases} x^2 + y^2 \leq 16 \\ x + y \geq 4 \end{cases}$$



54 20,000 inheritance, 7%, 9%, 11%
 interest per year = \$1,780
 (y) \$3000 less than 7% (x)
 11% \$1000 less than 7%

$$\begin{cases} x + y + z = 20000 \\ .07x + .09y + .11z = 1780 \\ -x + y = -3000 \\ -x + z = -1000 \end{cases}$$

$$\begin{cases} y = x - 3000 \\ z = x - 1000 \end{cases}$$

$$\begin{cases} x + y + z = 20000 \\ .07x + .09y + .11z = 1780 \\ -x + y = -3000 \\ -x + z = -1000 \end{cases}$$

$$\begin{cases} x + y + z = 20000 \\ 2y + 4z = 38000 \\ -x + y = -3000 \\ -x + z = -1000 \end{cases} \quad \begin{cases} -3z = -21000 \\ z = 7000 \end{cases}$$

$$\begin{cases} x + y + z = 20000 \\ 2y + 4z = 38000 \\ 2y + z = 17000 \\ -x + z = -1000 \end{cases} \quad \begin{cases} y = 5000 \\ -x + 7000 = -1000 \\ x = 8000 \end{cases}$$

$$\begin{cases} x + y + z = 20000 \\ 2y + 4z = 38000 \\ -3z = -21000 \\ -x + z = -1000 \end{cases} \quad \begin{cases} \text{check: } 8000 + 5000 + 7000 = 20000 \\ \text{check: } 2(5000) + 4(7000) = 38000 \end{cases}$$

$$\boxed{(8000, 5000, 7000)}$$

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$$\begin{cases} x + 2y \leq 160 \\ 3x + y \leq 180 \\ x \geq 0 \\ y \geq 0 \end{cases}$$

$$\begin{aligned} y &= 180 - 3x \\ x + 2(180 - 3x) &= 160 \\ x + 360 - 6x &= 160 \\ -5x &= -200 \\ x &= 40 \\ y &= 60 \end{aligned}$$

