

S. 20)

$$3a - 5b = 9$$

$$3a = 9 + 5b$$

$$a = \frac{9 + 5b}{3}$$

$$\text{para } b = 0 : a = 3$$

$$\text{para } b = 1 : a = \frac{14}{3}$$

$$\text{para } b = 2 : a = \frac{19}{3}$$

$$(a, b) = (3, 0)$$

$$(a, b) = \left(\frac{14}{3}, 1\right)$$

$$(a, b) = \left(\frac{19}{3}, 2\right)$$

S. 21)

$$(a) \quad x + 4y = -5$$

$$x = -4y - 5$$

$$3x - 8y = 45$$

$$x = -4(-3) - 5$$

$$3(-4y - 5) - 8y = 45$$

$$= 12 - 5 = 7$$

$$-12y - 15 - 8y = 45$$

$$(x, y) = (7, -3)$$

$$-20y = 60$$

$$y = -3$$

$$(b) \quad 3a - b = 11$$

$$-b = 11 - 3a$$

$$6a + 4b = 1$$

$$b = 3a - 11$$

$$6a + 4(3a - 11) = 1$$

$$b = 3\left(\frac{5}{2}\right) - 11$$

$$6a + 12a - 44 = 1$$

$$= \frac{15}{2} - \frac{22}{2}$$

$$18a = 45$$

$$a = \frac{5}{2}$$

$$= -\frac{7}{2}$$

$$(a, b) = \left(\frac{5}{2}, -\frac{7}{2}\right)$$

S.22)

$$(a) \quad 5x - 6y = -64 \rightarrow 5x - 6y = -64$$

$$7x + 3y = -44 \xrightarrow{\times 2} 14x + 6y = -88$$

$$19x = -152$$

$$x = -\frac{152}{19}$$

$$x = -8$$

$$3y = -44 - 7x$$

$$3y = -44 - 7(-8)$$

$$3y = -44 + 56$$

$$y = \frac{12}{3} = 4$$

$$(x, y) = (-8, 4)$$

$$(b) \quad 3x + 8y = -7 \xrightarrow{\times 2} 6x + 16y = -14$$

$$6x + 16y = 4 \rightarrow -6x + 16y = 4$$

$$0 = -18$$

No hay soluciones.

S.23)

$$(a) \quad 6x - 8y = 52$$

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

$$11x = 55$$

$$x = 5$$

$$8y = 3 - 5x$$

$$8y = 3 - 5(5)$$

$$8y = 3 - 25$$

$$8y = -22$$

$$y = -\frac{11}{4}$$

$$(x, y) = \left(5, -\frac{11}{4}\right)$$

$$(b) \quad \frac{r}{3} - \frac{s}{6} = \frac{1}{2}$$

$$\frac{2r}{6} - \frac{2+s}{6} = \frac{1}{2}$$

$$-r + s = 2$$

$$r - 2 = 3$$

$$s = 2 + r$$

$$r = 5$$

$$s = 7$$

$$(r, s) = (5, 7)$$

$$(c) \quad 10a + 4b = 26$$

$$\begin{array}{r} 10a + 4b = 26 \\ \hline 0 = 0 \end{array}$$

Infinitas Soluciones. Si  $t = a$ , tenemos

$$\begin{aligned} 4b &= 26 - 10a \\ 2b &= 13 - 5a \\ b &= \frac{13 - 5a}{2} \end{aligned}$$

$$(a, b) = \left( t, \frac{13 - 5t}{2} \right).$$

(d)

$$5x - 6y = 12 \quad \times 2 \rightarrow 10x - 12y = 24$$

$$2x - 7y = 14 \quad \times 5 \rightarrow \begin{array}{r} 10x - 35y = 70 \\ \hline 23y = -46 \end{array}$$

$$2x = 14 + 7y$$

$$y = -2$$

$$2x = 14 + 7(-2)$$

$$2x = 0$$

$$(x, y) = (0, -2)$$

$$x = 0$$

S.24)

$$3x + 2y = 8 \quad \times 2 \rightarrow 6x + 4y = 16$$

$$6x + 4y = 2a - 7 \rightarrow 6x + 4y = 2a - 7$$

$$2a - 7 = 16$$

$$2a = 23$$

$$a = \boxed{\frac{23}{2}}$$

S.25)

$$3x - 5y = -2.3$$

$$C = \boxed{10}$$

$$6x - cy = 9.3$$

S.26)

$$2u + v = 1$$

$$\frac{4u}{2} - \frac{v}{2} = 1$$

$$1u + 2v = 0$$

$$\frac{3v}{2} = 1$$

$$v = \frac{-u}{2}$$

$$u = \boxed{\frac{2}{3}}$$

S.27)

$$F - S + 2M = 65$$

$$M - S + 3F = 130$$

$$F + 2M = 70$$

$$- 6F + 2M = 270$$

$$\hline -5F = -200$$

$$F = \boxed{40}$$

5.28)

$$3(N+E) = 4 + 4N \rightarrow -N + 3E = 4$$

$$-N = 4 - 3E$$

$$N = 3E - 4$$

$$5(N-2) = 2 + 7E \rightarrow 5N - 7E = 12$$

$$N = 12 - 4$$

$$\underline{N = 8}$$

$$5(3E - 4) - 7E = 12$$

$$15E - 20 - 7E = 12$$

$$8E = 32$$

$$\underline{E = 4}$$

5.29)

$$\frac{x}{y} - 3 = \frac{2}{y} \rightarrow 2x - 6y = 4$$

$$2x - 9y = -8 \rightarrow \underline{2x - 9y = -8}$$

$$3y = 12$$

$$y = 4$$

$$2x = -8 + 9y$$

$$2x = -8 + 36$$

$$2x = 28$$

$$x = 14$$

$$(x, y) = (14, 4)$$

5.30)

$$P + 3q - 2r = 19$$

$$-2p + 7q - 6r = 26$$

$$-p - 2q + 8r = -31$$

Sumo (i) y (iii)

$$P + 3q - 2r = 19$$

$$+ -p - 2q + 8r = -31$$

$$\hline q + 6r = -12$$

$$2p + 6q - 4r = 38$$

$$-2p + 7q - 6r = 20$$

$$13q - 10r = 64$$

$$13(-12 - 6r) - 10r = 64$$

$$-156 - 78r - 10r = 64$$

$$-88r = 64 + 156$$

$$r = -\frac{220}{88} = -\frac{5}{2}$$

$$q = -12 - 6r$$

$$q = -12 - 6\left(-\frac{5}{2}\right)$$

$$q = -12 + 15$$

$$q = 3$$

$$p = 19 + 2r - 3q$$

$$= 19 - 5 - 9$$

$$= 5$$

$$(p, q, r) = \left(5, 3, -\frac{5}{2}\right)$$

5.31)

$$30 + 2a + b = 15 \quad \xrightarrow{\times -2} \quad -60 - 4a - 2b = -30$$

$$50 + 7a + 2b = 44 \quad \rightarrow + 50 + 7a + 2b = 44$$

$$0 + 3a + 5b = 26$$

$$-0 + 3a = 14$$

$$150 + 10a + 5b = 75$$

$$-0 = 14 - 3a$$

$$0 = 3a - 14$$

$$-0 + 3a + 5b = 26$$

$$0 = 3(5) - 14$$

$$= 1$$

$$140 + 7a = 49$$

$$14(3a - 14) + 7a = 49$$

$$b = 15 - 2a - 30$$

$$= 15 - 10 - 3$$

$$= 2$$

$$2(3a - 14) + a = 7$$

$$7a = 7 + 28$$

$$7a = 35$$

$$a = 5$$

Una manzana pesa 5 unidades

Un bonono pesa 2 unidades

Una naranja pesa 1

... unidades por unidad.