Problem 5.14)

(a) $\sqrt{a} + \sqrt{b} = 37$

$\sqrt{a} = 10 + 2\sqrt{b}$

(b)

$10 + 2\sqrt{b} + \sqrt{b} = 37$

$3\sqrt{b} = 27$

$\sqrt{b} = 9$

$b = 81$

$\sqrt{a} = 10 + 2(9)$

$\sqrt{a} = 28$

$a = 784$

Problem 5.15)

$\frac{3}{x} - \frac{2}{y} = -\frac{7}{2}$ $\xrightarrow{\times 2}$ $\frac{6}{x} - \frac{4}{y} = -\frac{14}{2}$

$\frac{6}{x} + \frac{4}{y} = 9$

$+ \quad \frac{6}{x} + \frac{4}{y} = \frac{18}{2}$

$\frac{12}{x} = 2$

$\frac{4}{y} = 8$

$6 = x$

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

$(x, y) = \left(6, \frac{1}{2}\right)$

Exercises

S.S.1) $\frac{6}{x} + \frac{7}{y} = 4$ $\qquad \frac{6}{x} + \frac{7}{y} = 4$

$\xrightarrow{\times 3}$ $\qquad \frac{6}{x} = \frac{15}{4} = 4\frac{3}{4}$

$\frac{2}{x} - \frac{5}{y} = 16 \quad \rightarrow$ $- \frac{2}{x} \quad \frac{y}{y} = 16$

$\frac{2}{x} - \frac{5}{(-1/2)} = 16$

$\frac{2}{x} + 10 = 16$

$\frac{2}{x} = 6$

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

$\frac{22}{y} = -44$

$-\frac{22}{44} = y$

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

$(x, y) = \left(\frac{1}{3}, -\frac{1}{2}\right)$

S.S.2)

$a^2 + b^2 = 65$

$+ \quad a^2 - b^2 = 33$

$2a^2 = 98$

$a^2 = 49$

$a = 7$

$b^2 = 65 - 49$

$b^2 = 16$

$b = 4$

$4a + 4b$

$4(4) + 4(7)$

$16 + 28 = \boxed{44}$

S.S.3)

$\sqrt[3]{r} + 9\sqrt{s} = 21$

$10\sqrt[3]{r} - \sqrt{s} = 28$

$\sqrt[3]{r} = x$

$\sqrt{s} = y$

$x + 9y = 21$

$10x - y = 28 \quad \xrightarrow{\times 9}$

$x + 9y = 21$

$+ \quad 90x - 9y = 252$

$91x = 273$

$$-y = 28 - 10x$$

$$y = 30 - 28$$

$$y = 2$$

$$x = \frac{273}{91} = \frac{39}{13} = 3$$

$$x = 3$$

$$(x, y) = (3, 2)$$

$$3\sqrt{r} = 3 \qquad r = 27$$

$$\sqrt{s} = 2 \qquad s = 4$$

$$(r, s) = (27, 4)$$