1   経済数学入門 I (自習用問題・略解)

問題 1.1.

(1) x^8 (2) x^{15} (3) x^3y^6 (4) $x^{13}y^6$

(5) $8x^3y^6$ (6) $2x^7y^6$ (7) $4x^2y^6$ (8) $-2x^5y^7$

問題 1.2.

(1) x^3 (2) $\dfrac{1}{x^2}$ (3) $\dfrac{2}{x^3}$ (4) $\dfrac{x^3}{2}$

(5) $\dfrac{x^3}{y^3}$ (6) y^2 (7) $\dfrac{5y}{4x}$ (8) $\dfrac{3x}{2y}$

問題 1.3.

(1) $2x - 6$ (2) $-x^2 + 3x$

(3) $2x^2 - 4x + 6$ (4) $-x^2 + 2x - 3$

(5) $x^3 - 2x^2 + 3x$ (6) $-3x^4 + 6x^3 - 9x^2$

(7) $2x^3y - 4x^2y^2 + 6xy^3$ (8) $-3x^4y + 6x^3y^2 - 9x^2y^3$

問題 1.4.

(1) $x - 2 + \dfrac{3}{x}$ (2) $x + 3 - \dfrac{4}{x}$

(3) $x^2 - 2x + 3 - \dfrac{4}{x}$ (4) $x^2 + 3 - \dfrac{4}{x}$

(5) $x - 2 + \dfrac{3}{x} - \dfrac{4}{x^2}$ (6) $x + \dfrac{3}{x} - \dfrac{4}{x^2}$

2 経済数学入門 I (自習用問題・略解)

問題 2.1.

(1) $5x + 3y$

(2) $x + 5y$

(3) $11y$

(4) $-6x^2 - 14xy + 3y^2$

(5) $x^2 + 5x + 6$

(6) $x^2 - xy - 6y^2$

(7) $x^3 - 4x^2 + 7x - 6$

(8) $x^6 - 1$

(9) $-2x^2 + 2x - 3$

(10) $-2x^2 - 2xy - y^2 + 4x - 2$

問題 2.2.

(1) $x^2 + 5x + 6$

(2) $x^2 - x - 12$

(3) $x^2 - 16$

(4) $x^2 - 8x + 16$

(5) $6x^2 + x - 12$

(6) $4x^2 + 12x + 9$

(7) $x^2 - xy - 6y^2$

(8) $6x^2 + xy - 12y^2$

(9) $x^3 - 4x^2 + 7x - 6$

(10) $x^6 - 1$

問題 2.3.

(1) $x^2(2x^2 - 3)$

(2) $-2x^3(x^3 - 2)$

(3) $x(2x^3 - 3x + 2)$

(4) $-2x^2(x^4 - 2x - 4)$

(5) $3x^2y^3(y + 4x)$

(6) $2x^3y(2y + 3x)$

(7) $x^4y^2(5y - 9x)$

(8) $3x^2y^4(y - 5x)$

(9) $2xy(2x^2 - 3xy + 6y^3)$

(10) $-x^3(4y^2 + 6xy - 3x^2)$

問題 2.4.

(1) $(3x - 4)(9x - 4)$

(2) $x(3x - 4)^2(15x - 8)$

(3) $3x^2(3x - 4)^3(7x - 4)$

(4) $2x^3(3x - 4)(9x - 8)$

(5) $4x^4(3x - 4)^2(6x - 5)$

(6) $12x^2(3x - 4)^4(2x - 1)$

(7) $2x^4(3x - 4)^2(3x - 10)$

(8) $-6x^2(3x - 4)^4(x + 2)$

3 経済数学入門Ⅰ(自習用問題・略解)

問題 3.1.

(1) $x = 3$

(2) $x = 3$

(3) $x = 2$

(4) $x = 2$

(5) $x = -2$

(6) $x = -\dfrac{2}{3}$

問題 3.2.

(1) $(x, y) = (3, 5)$

(2) $(x, y) = (3, 5)$

(3) $(x, y) = (2, -1)$

(4) $(x, y) = (2, -1)$

(5) $(x, y) = (-1, 2)$

(6) $(x, y) = (-2, -1)$

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

(8) $(x, y) = (6, 2)$

(9) $(x, y) = (5, 5)$

(10) $(x, y) = (\dfrac{16}{3}, 4)$

問題 3.3.

(1) $(x + 2)(x + 3)$

(2) $(x + 6)(x - 1)$

(3) $(x - 1)(x - 5)$

(4) $(x - 3)^2$

(5) $(x + 4)(x - 4)$

(6) $x(x - 16)$

(7) $2(x + 2)(x - 6)$

(8) $-3(x + 4)(x - 2)$

(9) $x(x - 2)(x - 3)$

(10) $-2x(x + 3)^2$

問題 3.4.

(1) $x = -2, -3$

(2) $x = -6, 1$

(3) $x = 1, 5$

(4) $x = 3$

(5) $x = -4, 4$

(6) $x = 0, 16$

(7) $x = -2, 6$

(8) $x = -4, 2$

(9) $x = 0, 2, 3$

(10) $x = 0, -3$

問題 **3.5.**

(1) $x = \dfrac{4}{3}, \dfrac{4}{9}$

(2) $x = 0, \dfrac{4}{3}, \dfrac{8}{15}$

(3) $x = 0, \dfrac{4}{3}, \dfrac{4}{7}$

(4) $x = 0, \dfrac{4}{3}, \dfrac{8}{9}$

(5) $x = 0, \dfrac{4}{3}, \dfrac{5}{6}$

(6) $x = 0, \dfrac{4}{3}, \dfrac{1}{2}$

(7) $x = 0, \dfrac{4}{3}, \dfrac{3}{10}$

(8) $x = 0, \dfrac{4}{3}, -2$

問題 **3.6.**

(1) $(x, y) = (1, 3), (2, 4)$

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

(3) $(x, y) = (2, 4), (-4, -2)$

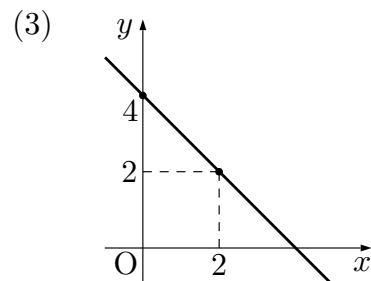(4) $(x, y) = (2, 3), (-3, -7)$

(5) $(x, y) = (1, 3), (-3, -1)$

(6) $(x, y) = (4, 7)$

4 経済数学入門Ⅰ(自習用問題・略解)

問題 **4.1.**

(1)

(2)

(3)

(4)

(5)

(6)
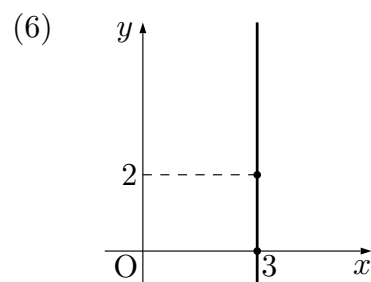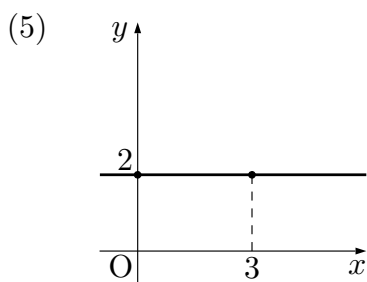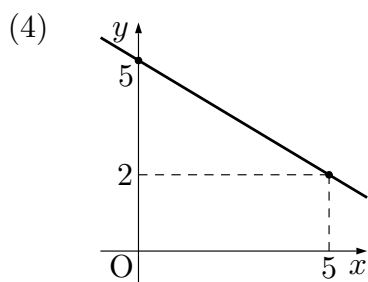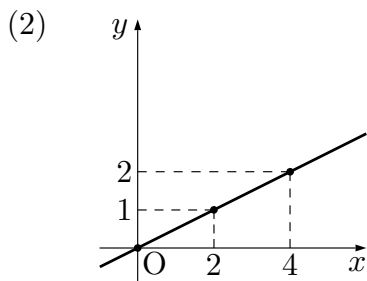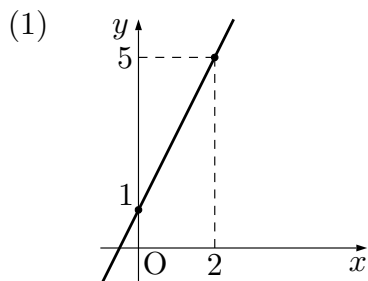
問題 **4.2.**

(1) $(x, y) = \mathbf{(2, 4)}$ (2) $(x, y) = \mathbf{(4, 2)}$ (3) $(x, y) = \mathbf{(2, 3)}$

(4) $(x, y) = \mathbf{(6, 7)}$ (5) $(x, y) = \mathbf{(6, 3)}$ (6) $(x, y) = \mathbf{(5, 2)}$

問題 **4.3.**

(1) $S = 6 \times 2 \times \dfrac{1}{2} = \mathbf{6}$

(2) $S = 6 \times 4 \times \dfrac{1}{2} = \mathbf{12}$

(3) $S = 8 \times 2 \times \dfrac{1}{2} = \mathbf{8}$

(4) $S = 8 \times 6 \times \dfrac{1}{2} = \mathbf{24}$

(5) $S = 5 \times 6 \times \dfrac{1}{2} = \mathbf{15}$

(6) $S = 5 \times 5 \times \dfrac{1}{2} = \dfrac{\mathbf{25}}{\mathbf{2}}$

(7) $S = 6 \times 3 \times \dfrac{1}{2} = \mathbf{9}$

(8) $S = 3 \times 9 \times \dfrac{1}{2} = \dfrac{\mathbf{27}}{\mathbf{2}}$

問題 **4.4.**

(1) $S = (6 + 3) \times 1 \times \dfrac{1}{2} = \dfrac{\mathbf{9}}{\mathbf{2}}$

(2) $S = (6 + 3) \times 2 \times \dfrac{1}{2} = \mathbf{9}$

(3) $S = (8 + 4) \times 1 \times \dfrac{1}{2} = \mathbf{6}$

(4) $S = \left(8 + \dfrac{16}{3}\right) \times 2 \times \dfrac{1}{2} = \dfrac{\mathbf{40}}{\mathbf{3}}$

(5) $S = \left(5 + \dfrac{10}{3}\right) \times 2 \times \dfrac{1}{2} = \dfrac{\mathbf{25}}{\mathbf{3}}$

(6) $S = (5 + 1) \times 4 \times \dfrac{1}{2} = \mathbf{12}$

5 経済数学入門Ⅰ(自習用問題・略解)

問題 5.1.

(1) 需要量 : $D = 10$, 供給量 : $S = 2$ 　　(2) 需要量 : $D = 4$, 供給量 : $S = 4$

(3) 需要量 : $D = 32$, 供給量 : $S = 12$ 　　(4) 需要量 : $D = 552$, 供給量 : $S = 32$

問題 5.2.

(1) 逆需要関数 : $p = -q + 12$

逆供給関数 : $p = q$

(2) 逆需要関数 : $p = -\dfrac{1}{4}q + 3$

逆供給関数 : $p = \dfrac{1}{2}q$

(3) 逆需要関数 : $p = -\dfrac{1}{4}q + 10$

逆供給関数 : $p = \dfrac{1}{6}q$

(4) 逆需要関数 : $p = -\dfrac{1}{24}q + 25$

逆供給関数 : $p = \dfrac{1}{16}q$

問題 5.3.

(1) $p^* = 6$, $q^* = 6$ 　　(2) $p^* = 2$, $q^* = 4$

(3) $p^* = 4$, $q^* = 24$ 　　(4) $p^* = 15$, $q^* = 240$

問題 5.4.

(1) $CS = (12 - 6) \times 6 \times \dfrac{1}{2} = 18$

$PS = (6 - 0) \times 6 \times \dfrac{1}{2} = 18$

$TS = (12 - 0) \times 6 \times \dfrac{1}{2} = 36$

(2) $CS = (3 - 2) \times 4 \times \dfrac{1}{2} = 2$

$PS = (2 - 0) \times 4 \times \dfrac{1}{2} = 4$

$TS = (3 - 0) \times 4 \times \dfrac{1}{2} = 6$

(3) $CS = (10 - 4) \times 24 \times \dfrac{1}{2} = 72$

$PS = (4 - 0) \times 24 \times \dfrac{1}{2} = 48$

$TS = (4 - 0) \times 24 \times \dfrac{1}{2} = 120$

(4) $CS = (25 - 15) \times 240 \times \dfrac{1}{2} = 1200$

$PS = (15 - 0) \times 240 \times \dfrac{1}{2} = 1800$

$TS = (25 - 0) \times 240 \times \dfrac{1}{2} = 3600$

(5) $CS = (10 - 7) \times 12 \times \dfrac{1}{2} = 18$

$PS = (7 - 5) \times 12 \times \dfrac{1}{2} = 12$

$TS = (10 - 5) \times 12 \times \dfrac{1}{2} = 30$

(6) $CS = (25 - 20) \times 120 \times \dfrac{1}{2} = 300$

$PS = \left(20 - \dfrac{25}{2}\right) \times 120 \times \dfrac{1}{2} = 450$

$TS = \left(25 - \dfrac{25}{2}\right) \times 120 \times \dfrac{1}{2} = 750$

6 経済数学入門 I (自習用問題・略解)

問題 6.1.

(1) 超過供給なので, $q^{**} = 50 - 2 \times 15 = 20$

(2) $CS = (25 - 15) \times 20 \times \dfrac{1}{2} = 100$

$PS = \{(15 - 0) + (15 - 10)\} \times 20 \times \dfrac{1}{2} = 200$

(3) 超過需要なので, $q^{**} = 2 \times 5 = 10$

(4) $CS = \{(25 - 5) + (20 - 5)\} \times 10 \times \dfrac{1}{2} = 175$

$PS = (5 - 0) \times 10 \times \dfrac{1}{2} = 25$

問題 6.2.

(1) 超過供給なので, $q^{**} = 120 - 4 \times 15 = 60$

(2) $CS = (30 - 15) \times 60 \times \dfrac{1}{2} = 450$

$PS = \left\{ \left(15 - \dfrac{5}{2}\right) + (15 - 10) \right\} \times 60 \times \dfrac{1}{2} = 525$

(3) 超過需要なので, $q^{**} = 8 \times 5 - 20 = 20$

(4) $CS = \{(30 - 5) + (25 - 5)\} \times 20 \times \dfrac{1}{2} = 450$

$PS = \left(5 - \dfrac{5}{2}\right) \times 20 \times \dfrac{1}{2} = 25$

問題 6.3.

(1) $\begin{cases} q = 50 - 2p \\ q = 2p - 10 \end{cases}$ を解いて, $p^{\dagger} = 15,\ q^{\dagger} = 20$

(2) $CS = (25 - 15) \times 20 \times \dfrac{1}{2} = 100$

$PS = (10 - 0) \times 20 \times \dfrac{1}{2} = 100$

(3) $\begin{cases} q = 50 - 2p \\ q = 2p - 30 \end{cases}$ を解いて, $p^{\dagger} = 20,\ q^{\dagger} = 10$

(4) $CS = (25 - 20) \times 10 \times \dfrac{1}{2} = 25$

$PS = (5 - 0) \times 10 \times \dfrac{1}{2} = 25$

問題 6.4.

(1) $\begin{cases} q = 120 - 4p \\ q = 8p - 60 \end{cases}$ を解いて, $p^{\dagger} = 15,\ q^{\dagger} = 60$

(2) $CS = (30 - 15) \times 60 \times \dfrac{1}{2} = 450$

$PS = \left(10 - \dfrac{5}{2}\right) \times 60 \times \dfrac{1}{2} = 225$

(3) $\begin{cases} q = 120 - 4p \\ q = 8p - 140 \end{cases}$ を解いて, $p^{\dagger} = \dfrac{65}{3},\ q^{\dagger} = \dfrac{100}{3}$

(4) $CS = \left(30 - \dfrac{65}{3}\right) \times \dfrac{100}{3} \times \dfrac{1}{2} = \dfrac{1250}{3}$

$PS = \left(\dfrac{20}{3} - \dfrac{5}{2}\right) \times \dfrac{100}{3} \times \dfrac{1}{2} = \dfrac{625}{3}$

(5) $GS = \left(\dfrac{65}{3} - \dfrac{20}{3}\right) \times \dfrac{100}{3} = 500$

$TS = \left\{\left(30 - \dfrac{5}{2}\right) + \left(\dfrac{65}{3} - \dfrac{20}{3}\right)\right\} \times \dfrac{100}{3} \times \dfrac{1}{2} = \dfrac{2125}{3}$

(6) 課税前の均衡取引量は $q^{*} = \dfrac{220}{3}$

よって, 死荷重は $\left(\dfrac{65}{3} - \dfrac{20}{3}\right) \times \left(\dfrac{220}{3} - \dfrac{110}{3}\right) \times \dfrac{1}{2} = 300$

問題 6.5.

(1) 課税後の供給関数は $q = \dfrac{3}{5}\left(p \div \dfrac{120}{100}\right) - 20 = \dfrac{1}{2}p - 20$

よって, $\begin{cases} q = 40 - \dfrac{1}{2}p \\ q = \dfrac{1}{2}p - 20 \end{cases}$ を解いて, $p^{\dagger} = 60,\ q^{\dagger} = 10$

(2) $CS = (80 - 60) \times 10 \times \dfrac{1}{2} = 100$

$PS = \left(50 - \dfrac{100}{3}\right) \times 10 \times \dfrac{1}{2} = \dfrac{250}{3}$

(3) $GS = (60 - 50) \times 10 = 100$

(4) 課税後の供給関数は $q = \dfrac{3}{5}\left(p \div \dfrac{105}{100}\right) - 20 = \dfrac{4}{7}p - 20$

よって, $\begin{cases} q = 40 - \dfrac{1}{2}p \\ q = \dfrac{4}{7}p - 20 \end{cases}$ を解いて, $p^{\dagger} = 56,\ q^{\dagger} = 12$

(5) $CS = (80 - 56) \times 12 \times \dfrac{1}{2} = 144$

$PS = \left(\dfrac{160}{3} - \dfrac{100}{3}\right) \times 12 \times \dfrac{1}{2} = 120$

(6) $GS = \left(56 - \dfrac{160}{3}\right) \times 12 = 32$

問題 6.6.

(1) 支給後の供給関数は $q = 8(p + 5) - 100 = 8p - 60$

よって, $\begin{cases} q = 120 - 4p \\ q = 8p - 60 \end{cases}$ を解いて, $p' = 15,\ q' = 60$

(2) $CS = (30 - 15) \times 60 \times \dfrac{1}{2} = 450$

$PS = \left(20 - \dfrac{25}{2}\right) \times 60 \times \dfrac{1}{2} = 225$

(3) $GS = -(20 - 15) \times 60 = -300$

7 経済数学入門 I (自習用問題・略解)

問題 7.1.

(1) 2 (2) −1 (3) $\dfrac{1}{3}$ (4) −0.8 (5) 0 (6) 0

問題 7.2.

(1) $2x$ (2) $6x$ (3) $6x^2$ (4) $-12x^3$ (5) $2x^3$ (6) $-\dfrac{3}{5}x^5$

問題 7.3.

(1) $f'(x) = 2x - 3$ (2) $f'(x) = -2x + 2$

(3) $f'(x) = x - 4$ (4) $f'(x) = -\dfrac{1}{2}x - \dfrac{1}{3}$

(5) $f'(x) = 3x^2 - 4x + 3$ (6) $f'(x) = -6x^2 + 6x - 4$

(7) $f'(x) = x^3 + x^2 + x + 1$ (8) $f'(x) = \dfrac{1}{6}x^3 - \dfrac{1}{2}x^2 + x - 1$

問題 7.4.

(1) $f'(2) = 1$ (2) $f'(2) = -2$

(3) $f'(2) = -2$ (4) $f'(2) = -\dfrac{4}{3}$

(5) $f'(2) = 7$ (6) $f'(2) = -16$

(7) $f'(2) = 15$ (8) $f'(2) = \dfrac{1}{3}$

9 経済数学入門Ⅰ(自習用問題・略解)

問題 9.1.

(1) $x = 4$

(2) $x = 3$

(3) $x = 2$

(4) $x = -1$

(5) $x = 1, 2$

(6) $x = 2, -2$

(7) $x = 3, -1$

(8) $x = 6, -1$

問題 9.2.

(1) $f''(x) = 2$

(2) $f''(x) = \dfrac{2}{3}$

(3) $f''(x) = -2$

(4) $f''(x) = -4$

(5) $f''(x) = 2x - 3$

(6) $f''(x) = 6x$

(7) $f''(x) = -2x + 2$

(8) $f''(x) = -x + \dfrac{5}{2}$

問題 9.3.

(1) $f''(3) = 2$

(2) $f''(3) = \dfrac{2}{3}$

(3) $f''(3) = -2$

(4) $f''(3) = -4$

(5) $f''(3) = 3$

(6) $f''(3) = 18$

(7) $f''(3) = -4$

(8) $f''(3) = -\dfrac{1}{2}$

問題 9.4.

(1) $x = 4$ のとき 極小

(2) $x = 3$ のとき 極小

(3) $x = 2$ のとき 極大

(4) $x = -1$ のとき 極大

(5) $x = 1$ のとき 極大
$x = 2$ のとき 極小

(6) $x = -2$ のとき 極大
$x = 2$ のとき 極小

(7) $x = 3$ のとき 極大
$x = -1$ のとき 極小

(8) $x = 6$ のとき 極大
$x = -1$ のとき 極小

10　経済数学入門Ⅰ(自習用問題・略解)

問題 10.1.

(1) 極大値：なし

(2) 極大値：なし

(3) 極大値：$f(2) = \mathbf{0}$

(4) 極大値：$f(-1) = \mathbf{8}$

(5) 極大値：$f(1) = \dfrac{\mathbf{1}}{\mathbf{6}}$

(6) 極大値：$f(-2) = \mathbf{16}$

(7) 極大値：$f(3) = \mathbf{5}$

(8) 極大値：$f(6) = \mathbf{12}$

(9) 極大値：$f(4) = \mathbf{-4}$

(10) 極大値：$f(-2) = \mathbf{30}$

(11) 極大値：$f(0) = \mathbf{0}$

(12) 極大値：$f(1), f(-1) = \mathbf{1}$

問題 10.2.

(1) 最大値：$f(0) = \mathbf{6}$

(2) 最大値：$f(-2) = \dfrac{\mathbf{19}}{\mathbf{3}}$

(3) 最大値：$f(2) = \mathbf{0}$

(4) 最大値：$f(0) = \mathbf{6}$

(5) 最大値：$f(3) = \dfrac{\mathbf{1}}{\mathbf{2}}$

(6) 最大値：$f(-2) = \mathbf{16}$

(7) 最大値：$f(3) = \mathbf{5}$

(8) 最大値：$f(3) = \dfrac{\mathbf{3}}{\mathbf{4}}$

(9) 最大値：$f(0) = \mathbf{12}$

(10) 最大値：$f(0) = \mathbf{2}$

(11) 最大値：$f(2) = \mathbf{4}$

(12) 最大値：$f(1), f(-1) = \mathbf{1}$

11 経済数学入門Ⅰ(自習用問題・略解)

問題 11.1.

(1) $C(2) = 16$, $FC = 4$, $VC(x) = x^2 + 4x$, $VC(2) = 12$

(2) $C(2) = 16$, $FC = 6$, $VC(x) = x^2 + 3x$, $VC(2) = 10$

(3) $C(2) = \dfrac{56}{3}$, $FC = 4$, $VC(x) = \dfrac{1}{3}x^3 + x^2 + 4x$, $VC(2) = \dfrac{44}{3}$

(4) $C(2) = 18$, $FC = 6$, $VC(x) = x^3 - 3x^2 + 8x$, $VC(2) = 12$

問題 11.2.

(1) $AVC(x) = x + 4$, $AC(2) = 8$, $AVC(2) = 6$, $AFC(2) = 2$

(2) $AVC(x) = x + 3$, $AC(2) = 8$, $AVC(2) = 5$, $AFC(2) = 3$

(3) $AVC(x) = \dfrac{1}{3}x^2 + x + 4$, $AC(2) = \dfrac{28}{3}$, $AVC(2) = \dfrac{22}{3}$, $AFC(2) = 2$

(4) $AVC(x) = x^2 - 3x + 8$, $AC(2) = 9$, $AVC(2) = 6$, $AFC(2) = 3$

問題 11.3.

(1) $MC(x) = 2x + 4$, $MC(2) = 8$

(2) $MC(x) = 2x + 3$, $MC(2) = 7$

(3) $MC(x) = x^2 + 2x + 4$, $MC(2) = 12$

(4) $MC(x) = 3x^2 - 6x + 8$, $MC(2) = 8$

問題 11.4.

(1) $R(x) = 10x$, $MR(x) = 10$, $\pi(x) = -x^2 + 6x - 4$, $\pi(2) = 4$

(2) $R(x) = 10x - x^2$, $MR(x) = 10 - 2x$, $\pi(x) = -2x^2 + 7x - 6$, $\pi(2) = 0$

(3) $R(x) = 12x$, $MR(x) = 12$, $\pi(x) = -\dfrac{1}{3}x^3 - x^2 + 8x - 4$, $\pi(2) = \dfrac{16}{3}$

(4) $R(x) = 12x - x^2$, $MR(x) = 12 - 2x$, $\pi(x) = -x^3 + 2x^2 + 4x - 6$, $\pi(2) = 2$

12 経済数学入門Ⅰ(自習用問題・略解)

問題 12.1.

最適な生産量 : $x^* = \mathbf{2}$

($R(x) = 12x - x^2,\ \pi(x) = -x^2 + 8x - 4,\ \pi(x^*) = 4$)

問題 12.2.

最適な生産量 : $x^* = \mathbf{4}$

($R(x) = 10x - x^2,\ \pi(x) = -\dfrac{1}{3}x^3 + \dfrac{3}{2}x^2 + 4x - \dfrac{2}{3},\ \pi(x^*) = 18$)

問題 12.3.

最適な生産量 : $x^* = \mathbf{3}$

($R(x) = 18x - \dfrac{1}{2}x^2,\ \pi(x) = -x^3 - \dfrac{9}{2}x^2 + 54x - 72,\ \pi(x^*) = \dfrac{45}{2}$)

問題 12.4.

最適な生産量 : $x^* = \mathbf{4}$

($R(x) = 10x - 2x^2,\ \pi(x) = -\dfrac{1}{3}x^3 + \dfrac{5}{2}x^2 - 4x - \dfrac{1}{6},\ \pi(x^*) = \dfrac{5}{2}$)

問題 12.5.

最適な生産量 : $x^* = \mathbf{6}$

($R(x) = 16x,\ \pi(x) = -x^2 + 12x - 4,\ \pi(x^*) = 32$)

問題 12.6.

最適な生産量 : $x^* = \mathbf{4}$

($R(x) = 2x,\ \pi(x) = -\dfrac{1}{3}x^3 + \dfrac{5}{2}x^2 - 4x - \dfrac{2}{3},\ \pi(x^*) = 2$)

13 経済数学入門 I (自習用問題・略解)

問題 13.1.

(1) $(x, y) = (3, 6)$

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

(3) $(x, y) = (2, 8)$

(4) $(x, y) = (3, 6)$

問題 13.2.

(1) $(x, y) = (\dfrac{9}{2}, \dfrac{3}{2})$

(2) $(x, y) = (6, 1)$

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

(4) $(x, y) = (\dfrac{9}{2}, \dfrac{3}{2})$

問題 13.3.

(1) $(x, y) = (8, \dfrac{8}{3})$

(2) $(x, y) = (4, \dfrac{16}{3})$

(3) $(x, y) = (9, 2)$

(4) $(x, y) = (3, 6)$

問題 13.4.

(1) $(x, y) = (10, 4)$

(2) $(x, y) = (5, 8)$

(3) $(x, y) = (\dfrac{45}{4}, 3)$

(4) $(x, y) = (\dfrac{15}{4}, 9)$

14 経済数学入門 I (自習用問題・略解)

問題 14.1.

(1) $\dfrac{12-10}{10}=\dfrac{\mathbf{1}}{\mathbf{5}}$ (20%)

(2) $\dfrac{16-10}{10}=\dfrac{\mathbf{3}}{\mathbf{5}}$ (60%)

(3) $\dfrac{180-200}{200}=-\dfrac{\mathbf{1}}{\mathbf{10}}$ (-10%)

(4) $\dfrac{120-200}{200}=-\dfrac{\mathbf{2}}{\mathbf{5}}$ (-40%)

問題 14.2.

(1) $E=\dfrac{180-200}{12-10}\cdot\dfrac{10}{200}=-\dfrac{\mathbf{1}}{\mathbf{2}}$

(2) $E=\dfrac{120-200}{12-10}\cdot\dfrac{10}{200}=\mathbf{-2}$

(3) $E=\dfrac{180-200}{16-10}\cdot\dfrac{10}{200}=-\dfrac{\mathbf{1}}{\mathbf{6}}$

(4) $E=\dfrac{120-200}{16-10}\cdot\dfrac{10}{200}=-\dfrac{\mathbf{2}}{\mathbf{3}}$

問題 14.3.

(1) $E=\dfrac{200-250}{18-15}\cdot\dfrac{15}{250}=\mathbf{-1}$

(2) $E=\dfrac{240-250}{18-15}\cdot\dfrac{15}{250}=-\dfrac{\mathbf{1}}{\mathbf{5}}$

(3) $E=\dfrac{300-250}{12-15}\cdot\dfrac{15}{250}=\mathbf{-1}$

(4) $E=\dfrac{350-250}{12-15}\cdot\dfrac{15}{250}=\mathbf{-2}$

問題 14.4.

(1) $E(5)=-2\cdot\dfrac{5}{20}=-\dfrac{\mathbf{1}}{\mathbf{2}}$ (非弾力的)

(2) $E(6)=-2\cdot\dfrac{6}{18}=-\dfrac{\mathbf{2}}{\mathbf{3}}$ (非弾力的)

(3) $E(7)=-2\cdot\dfrac{7}{16}=-\dfrac{\mathbf{7}}{\mathbf{8}}$ (非弾力的)

(4) $E(8)=-2\cdot\dfrac{8}{14}=-\dfrac{\mathbf{8}}{\mathbf{7}}$ (弾力的)

問題 14.5.

(1) $E(5)=-8\cdot\dfrac{5}{160}=-\dfrac{\mathbf{1}}{\mathbf{4}}$ (非弾力的)

(2) $E(10)=-8\cdot\dfrac{10}{120}=-\dfrac{\mathbf{2}}{\mathbf{3}}$ (非弾力的)

(3) $E(15)=-8\cdot\dfrac{15}{80}=-\dfrac{\mathbf{3}}{\mathbf{2}}$ (弾力的)

(4) $E(20)=-8\cdot\dfrac{20}{40}=\mathbf{-4}$ (弾力的)