高知工科大学

基礎数学ワークブック

(2001年度版)

秋期入学者用

II

解答

< 原始関数 > (1ページ)

問1の解答

(1) $\frac{1}{5}x^5 + C$

(2) $\frac{1}{6}x^6 + C$

(3) $\frac{1}{7}x^7 + C$

< 不定積分 1 > (2ページ)

問1の解答

(1) $\frac{1}{5}x^5 + C$

(2) $\frac{1}{6}x^6 + C$

(3) $\frac{1}{7}x^7 + C$

問2の解答

$$\frac{1}{n+1}x^{n+1} + C$$

< 不定積分 2 > (3ページ)

問1の解答

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

(2) $2x^3 - 2x^2 - 5x + C$

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

問2の解答

$$\int \Big\{ \big(5x^2 - x - 6\big) - 5\left(x^2 - x + 1\right) \Big\} dx$$

$$= \int \Big\{ 5x^2 - x - 6 - 5x^2 + 5x - 5 \Big\} dx$$

$$= \int (4x - 11)\, dx$$

$$= 2x^2 - 11x + C$$

< 数列の和 1 > (4ページ)

問1の解答

$$a_4 = \frac{6}{4 \times 9} \times (1 + 4 + 9 + 16) = \frac{30}{6} = 5$$

$$a_5 = \frac{6}{5 \times 11} \times (1 + 4 + 9 + 16 + 25) = \frac{6}{55} \times 55 = 6$$

問2の解答

$$a_n = n + 1$$

問3の解答

$$b_n = \frac{n\,(2n+1)}{6} \times a_n = \frac{n\,(n+1)\,(2n+1)}{6}$$

問4の解答

$$b_5 = \frac{5 \times 6 \times 11}{6} = 55$$

問5の解答

$$1 + 4 + 9 + 16 + 25 = 55$$

< 数列の和 2 > (5ページ)

問1の解答

$a_4 = 1+2+3+4 = 10$, $b_4 = 1+8+27+64 = 100$

$a_5 = 1+2+3+4+5 = 15$, $b_5 = 1+8+27+64+125 = 225$

問2の解答

$b_n = {a_n}^2$

問3の解答

$$a_n = 1+2+3+\cdots+n = \frac{n\,(n+1)}{2}$$

問4の解答

$$b_n = {a_n}^2 = \left\{\frac{n\,(n+1)}{2}\right\}^2$$

問5の解答

$$b_5 = \left\{\frac{5\times 6}{2}\right\}^2 = 15^2 = 225$$

< 和の記号 Σ(シグマ) 1 > (6ページ)

問の解答

(1) $2+3+4+5+6+7+8+9+10+11=65$

(2) $2+8+18+32+50+72+98=280$

(3) $(3-1)+(3^2-1)+\cdots+(3^n-1)$

$=2+8+\cdots+(3^n-1)$

< 和の記号 Σ(シグマ) 2 > (7ページ)

問1の解答

(1) $\displaystyle\sum_{k=1}^{n} k$

(2) $\displaystyle\sum_{k=1}^{n} (2k-1)(2k)$

(3) $\displaystyle\sum_{k=1}^{8} (2k-1)$

(4) $\displaystyle\sum_{k=1}^{25} (4k-2)$

問2の解答

(1) $(36-1)+(49-1)+(64-1)+(81-1)+(100-1)+(121-1)$

$= 35+48+63+80+99+120 = 445$

(2) $(4-3)^2+(6-3)^2+(8-3)^2+(10-3)^2+(12-3)^2$

$= 1+9+25+49+81 = 165$

< 和の記号 Σ(シグマ) 3 > (8ページ)

問の解答

(1) $2\sum_{k=1}^{n} k + \sum_{k=1}^{n} 1 = 2\left(\frac{n(n+1)}{2}\right) + n = n^2 + 2n$

(2) $10\sum_{k=1}^{n} k - 5\sum_{k=1}^{n} 1 = 10\left(\frac{n(n+1)}{2}\right) - 5n = 5n^2 + 5n - 5n = 5n^2$

< 和の記号 Σ(シグマ) 4 > (9ページ)

問の解答

(1) $\displaystyle\sum_{k=1}^{n}(2k-1)=2\sum_{k=1}^{n}k-\sum_{k=1}^{n}1=2\left(\frac{n(n+1)}{2}\right)-n=n^2$

(2) $\displaystyle\sum_{k=1}^{n}(4k-2)=4\sum_{k=1}^{n}k-2\sum_{k=1}^{n}1=4\left(\frac{n(n+1)}{2}\right)-2n=2n^2$

(3) $\displaystyle\sum_{k=1}^{n}(6k-5)=6\sum_{k=1}^{n}k-5\sum_{k=1}^{n}1=6\left(\frac{n(n+1)}{2}\right)-5n=3n^2-2n$

< 和の記号 Σ(シグマ) 5 > (10ページ)

問1の解答

$$\sum_{k=1}^{n} k^2 = \frac{n\,(n+1)\,(2n+1)}{6}$$

問2の解答

(1) $\displaystyle\sum_{k=1}^{5} k^2 = \frac{5 \times 6 \times 11}{6} = 55$

(2) $\displaystyle\sum_{k=1}^{n+1} k^2 = \frac{(n+1)\,(n+2)\,(2n+3)}{6}$

< 和の記号 Σ(シグマ) 6 > (11ページ)

問1の解答

$$\sum_{k=1}^{n} k^3 = \left\{ \frac{n\,(n+1)}{2} \right\}^2$$

問2の解答

(1) $\displaystyle\sum_{k=1}^{5} k^3 = \left\{ \frac{5 \times 6}{2} \right\}^2 = 15^2 = 225$

(2) $\displaystyle\sum_{k=1}^{n-1} k^3 = \left\{ \frac{(n-1)\,n}{2} \right\}^2$

< 和の記号 Σ(シグマ) 7 > (12ページ)

問1の解答

(1) $x_1 + x_2 + x_3 + x_4$, (2) $y_5 + y_6 + y_7 + y_8 + y_9 + y_{10} + y_{11}$

(3) $3^2 + 4^2 + 5^2 + 6^2 + 7^2$, (4) $1^3 + 2^3 + 3^3 + 4^3 + \cdots + (n-2)^3$

問2の解答

$$\left\{\sum_{j=1}^{4}(x_3 - y_j)\right\} + \left\{\sum_{j=1}^{4}(x_4 - y_j)\right\} + \left\{\sum_{j=1}^{4}(x_5 - y_j)\right\}$$

$$\begin{aligned} &= (x_3 - y_1) + (x_3 - y_2) + (x_3 - y_3) + (x_3 - y_4) \\ &\quad + (x_4 - y_1) + (x_4 - y_2) + (x_4 - y_3) + (x_4 - y_4) \\ &\quad + (x_5 - y_1) + (x_5 - y_2) + (x_5 - y_3) + (x_5 - y_4) \\ &= 4(x_3 + x_4 + x_5) - 3(y_1 + y_2 + y_3 + y_4) \end{aligned}$$

< 区分求積法 1 > (13ページ)

問の解答

$$\lim_{n\to\infty} \frac{1}{6}\left(1-\frac{1}{n}\right)\left(2-\frac{1}{n}\right) = \frac{1}{6}\times 1\times 2 = \frac{1}{3}$$

< 区分求積法 2 > (14ページ)

問の解答

$$
\begin{aligned}
S_n^* &= h^2 h + (2h)^2 h + \cdots + \Big((n-1)h\Big)^2 h + (nh)^2 h \\
&= h^3 \Big\{1^2 + 2^2 + \cdots + (n-1)^2 + n^2\Big\} \\
&= h^3 \sum_{k=1}^{n} k^2 = h^3 \times \frac{n(n+1)(2n+1)}{6} \\
&= \left(\frac{1}{n}\right)^3 \times \frac{1}{6} \times n \times (n+1) \times (2n+1) \\
&= \frac{1}{6} \times \left(1 + \frac{1}{n}\right) \times \left(2 + \frac{1}{n}\right)
\end{aligned}
$$

$$
\begin{aligned}
\lim_{n\to\infty} S_n^* &= \lim_{n\to\infty} \frac{1}{6} \times \left(1 + \frac{1}{n}\right) \times \left(2 + \frac{1}{n}\right) \\
&= \frac{1}{6} \times 1 \times 2 \\
&= \frac{1}{3}
\end{aligned}
$$

< 区分求積法 3 > (15ページ)

問の解答

$$
\begin{aligned}
S_n^* &= h^3 h + (2h)^3 h + (3h)^3 h + \cdots + (nh)^3 h \\
&= h^4 \left\{ 1^3 + 2^3 + 3^3 + \cdots + n^3 \right\} \\
&= h^4 \times \sum_{k=1}^{n} k^3 \\
&= h^4 \times \left\{ \frac{n\,(n+1)}{2} \right\}^2 \\
&= \left(\frac{1}{n} \right)^4 \times \frac{1}{4} \times n^2 \times (n+1)^2 \\
&= \frac{1}{4} \times \left(1 + \frac{1}{n} \right)^2
\end{aligned}
$$

$$
\begin{aligned}
\lim_{n\to\infty} S_n^* &= \lim_{n\to\infty} \frac{1}{4} \times \left(1 + \frac{1}{n} \right)^2 \\
&= \frac{1}{4} \times 1^2 \\
&= \frac{1}{4}
\end{aligned}
$$

$<$ 面積関数$S(x)$ 1 $>$ (16ページ)

問の解答

$$
\begin{aligned}
S_n^*(x) &= h^2 h + (2h)^2 h + \cdots + (nh)^2 h \\
&= h^3 \left\{ 1^2 + 2^2 + 3^2 + \cdots + n^2 \right\} \\
&= h^3 \sum_{k=1}^{n} k^2 \\
&= \left(\frac{x}{n} \right)^3 \times \frac{n\,(n+1)\,(2n+1)}{6} \\
&= \frac{x^3}{6} \times \left(1 + \frac{1}{n} \right) \times \left(2 + \frac{1}{n} \right)
\end{aligned}
$$

$$
\begin{aligned}
\lim_{n \to \infty} S_n^*(x) &= \lim_{n \to \infty} \frac{x^3}{6} \times \left(1 + \frac{1}{n} \right) \times \left(2 + \frac{1}{n} \right) \\
&= \frac{x^3}{6} \times 1 \times 2 \\
&= \frac{x^3}{3}
\end{aligned}
$$

$<$ 面積関数$S(x)$ 2 $>$ (17ページ)

問の解答

$$
\begin{aligned}
S_n^*(x) &= h^3 h + (2h)^3 h + \cdots + (nh)^3 h \\
&= h^4 \left\{ 1^3 + 2^3 + \cdots + n^3 \right\} \\
&= h^4 \sum_{k=1}^{n} k^3 \\
&= h^4 \left\{ \frac{n\,(n+1)}{2} \right\}^2 \\
&= \left(\frac{x}{n} \right)^4 \times \frac{1}{4} \times n^2 \times (n+1)^2 \\
&= \frac{x^4}{4} \times \left(1 + \frac{1}{n} \right)^2
\end{aligned}
$$

$$
\begin{aligned}
\lim_{n\to\infty} S_n^*(x) &= \lim_{n\to\infty} \frac{x^4}{4} \times \left(1 + \frac{1}{n} \right)^2 \\
&= \frac{x^4}{4} \times 1^2 \\
&= \frac{x^4}{4}
\end{aligned}
$$

$<$ 面積関数$S(x)$ 3 $>$ (18ページ)

問1の解答

(1) x

(2) $\frac{1}{2}x^2$

(3) $\frac{1}{3}x^3$

(4) $\frac{1}{4}x^4$

問2の解答

$$S(x) = \frac{1}{5}x^5$$

問3の解答

$$S(x) = \frac{1}{n+1}x^{n+1}$$

問4の解答

$$S'(x) = f(x)$$

または、

$$\int f(x)dx = S(x) + C$$

$<$ 面積関数$S(x)$ 4 $>$ (19ページ)

問の解答

$$
\begin{aligned}
S(x) &= \int f(x)dx \\
&= \int \left(x^3 - 5x^2 + 3x + 9\right) dx \\
&= \frac{1}{4}x^4 - \frac{5}{3}x^3 + \frac{3}{2}x^2 + 9x + C
\end{aligned}
$$

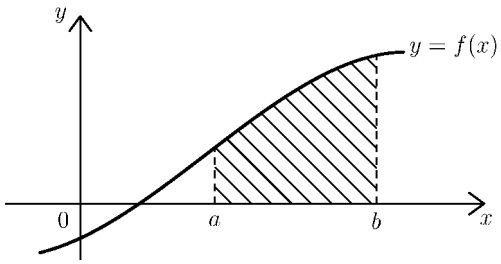
$S(0) = C = 0$ より、

$$S(x) = \frac{1}{4}x^4 - \frac{5}{3}x^3 + \frac{3}{2}x^2 + 9x$$

$$
\begin{aligned}
S &= S(4) - S(3) \\
&= \frac{1}{4} \times 4^4 - \frac{5}{3} \times 4^3 + \frac{3}{2} \times 4^2 + 9 \times 4 - \left(\frac{1}{4} \times 3^4 - \frac{5}{3} \times 3^3 + \frac{3}{2} \times 3^2 + 9 \times 3\right) \\
&= \frac{19}{12}
\end{aligned}
$$

< 定積分の定義 > (20 ページ)

問の解答



上図斜線部分の面積

< 定積分 1 > (22 ページ)

問の解答

(1) $\left[x \right]_{-3}^{7} = 7 - (-3) = 10$

(2) $\left[\frac{1}{2}x^2 \right]_{0}^{9} = \frac{81}{2}$

(3) $\left[\frac{1}{3}x^3 \right]_{-2}^{4} = \frac{1}{3} \times 4^3 - \frac{1}{3} \times (-2)^3 = 24$

(4) $\left[\frac{1}{4}x^4 \right]_{-1}^{3} = \frac{1}{4} \times 3^4 - \frac{1}{4} \times (-1)^4 = 20$

< 定積分 2 > (23ページ)

問の解答

(1) 0

(2) 0

(3) 0

(4) $\left[\frac{1}{4}x^4\right]_3^1 = \frac{1}{4} - \frac{1}{4}\times 3^4 = -\frac{80}{4} = -20$

(5) $\left[\frac{1}{5}x^5\right]_2^{-1} = -\frac{1}{5} - \frac{32}{5} = -\frac{33}{5}$

(6) $\left[x^3 - x\right]_3^{-3} = -27 + 3 - (27 - 3) = -48$

(7) $\left[x - \frac{x^3}{3}\right]_4^0 = -\left(4 - \frac{64}{3}\right) = \frac{52}{3}$

(8) $\left[\frac{3}{4}x^4 - \frac{7}{2}x^2 + x\right]_2^{-2} = \left(\frac{3}{4}\times 16 - \frac{7}{2}\times 4 - 2\right) - \left(\frac{3}{4}\times 16 - \frac{7}{2}\times 4 + 2\right) = -4$

< 分数の微分 > (24ページ)

問1の解答

$$\lim_{h\to 0}\frac{\dfrac{x^3-(x+h)^3}{(x+h)^3x^3}}{h}=\lim_{h\to 0}\frac{x^3-(x^3+3x^2h+3xh^2+h^3)}{(x+h)^3x^3h}=\lim_{h\to 0}\frac{-3x^2h-3xh^2-h^3}{(x+h)^3x^3h}$$

$$=\lim_{h\to 0}\frac{-3x^2-3xh-h^2}{(x+h)^3x^3}=\frac{-3x^2}{x^3x^3}=-\frac{3}{x^4}$$

問2の解答

(1) $-\dfrac{4}{x^5}$

(2) $-\dfrac{n}{x^{n+1}}$

問3の解答

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

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

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

(4) $\dfrac{1}{x^5}$

(5) $\dfrac{1}{x^{n+1}}$

(6) $\dfrac{1}{x^n}$

< 整数指数 > (25ページ)

問の解答

(1) 1

(2) 1

(3) $\frac{1}{9}$

(4) $\frac{1}{2}$

(5) $\frac{1}{3}$

(6) $\frac{128}{3}$

(7) 64

(8) $\frac{1}{81}$

(9) 125

< 負の累乗関数の微分・積分 > (26 ページ)

問 1 の解答

(1) $-\dfrac{1}{x^2}$

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

(3) $-\dfrac{9}{x^{10}}$

問 2 の解答

(1) $\displaystyle\int x^{-3}dx = \frac{1}{-2}x^{-2} + C = -\frac{1}{2x^2} + C$

(2) $\displaystyle\int x^{-9}dx = \frac{1}{-8}x^{-8} + C = -\frac{1}{8x^8} + C$

(3) $-\dfrac{1}{3}x^{-3} + C = -\dfrac{1}{3x^3} + C$

(4) $-\dfrac{1}{10}x^{-10} + C = -\dfrac{1}{10x^{10}} + C$

< 累乗根 1 > (27ページ)

問の解答

(1) 9

(2) 3

(3) 4

(4) 5

(5) $\frac{2}{3}$

(6) $\sqrt{\frac{9}{4}} = \frac{3}{2}$

< 累乗根 2 > (28 ページ)

問の解答

(1) $\sqrt{6}$

(2) $\sqrt[3]{8} = 2$

(3) $\sqrt{\dfrac{12}{3}} = 2$

(4) $\sqrt[5]{\dfrac{96}{3}} = 2$

< 累乗根 3 > (29 ページ)

問 1 の解答

(1) $2\sqrt[3]{7}$

(2) $3\sqrt{2}$

(3) $3\sqrt[4]{3}$

問 2 の解答

(1) $\left(8^{\frac{1}{6}}\right)^2 = 8^{\frac{2}{6}} = 2$

(2) $125^{\frac{1}{3}} = 5$

(3) $9^{\frac{3}{2}} = 27$

(4) $32^{\frac{2}{10}} = 2$

< 分数指数 1 > (30 ページ)

問の解答

(1) $\sqrt{169} = 13$

(2) $\sqrt{125} = 5\sqrt{5}$

(3) $(6^2)^{\frac{3}{2}} = 6^3 = 216$

(4) $(7^3)^{\frac{2}{3}} = 7^2 = 49$

(5) $(2^8)^{\frac{3}{4}} = 2^6 = 64$

(6) $(2^6)^{\frac{7}{6}} = 2^7 = 128$

(7) $\dfrac{1}{\sqrt{4}} = \dfrac{1}{2}$

(8) $\left(10^3\right)^{-\frac{2}{3}} = 10^{-2} = \dfrac{1}{100}$

(9) $\left(5^4\right)^{-\frac{3}{4}} = 5^{-3} = \dfrac{1}{125}$

< 分数指数 2 > (31 ページ)

問 1 の解答

(1) $4^{\frac{3}{6}} = \sqrt{4} = 2$

(2) $6^{\frac{3}{9}} = \sqrt[3]{6}$

(3) $4^{\frac{6}{3}} = 16$

(4) $8^{\frac{4}{6}} = (2^3)^{\frac{2}{3}} = 2^2 = 4$

問 2 の解答

(1) $\sqrt{2} \times \sqrt{2} = 2$

(2) $\dfrac{\sqrt{8}}{\sqrt{2}} = \sqrt{4} = 2$

(3) $\left(\left(8^{\frac{1}{2}}\right)^{\frac{1}{6}}\right)^4 = 8^{\frac{1}{3}} = 2$

(4) $\left(\left((2^8)^{\frac{1}{4}}\right)^{\frac{1}{3}}\right)^{\frac{1}{2}} = 2^{\frac{1}{3}} = \sqrt[3]{2}$

< 指数法則 > (32ページ)

問1の解答

正の数 a と b、および有理数 p と q に対して

$1^\circ : a^p \times a^q = a^{\boxed{p+q}}$, $2^\circ : a^p \div a^q = a^{\boxed{p-q}}$

$3^\circ : (a^p)^q = a^{\boxed{p\ q}}$, $4^\circ : (ab)^p = a^p b^p$

問2の解答

(1) $a^{\frac{1}{3}} \times a^{\frac{2}{3}} = a$

(2) $a^{\frac{1}{4}} \times a^{\frac{3}{4}} = a$

(3) $\left(a^{\frac{1}{3}}\right)^{\frac{9}{2}} = a^{\frac{3}{2}} = a\sqrt{a}$

(4) $a^{\frac{8}{3}-\frac{2}{3}} = a^2$

(5) $a^{\frac{2}{3}} \div \left(a^{\frac{1}{2}}\right)^{-\frac{2}{3}} = a$

(6) $\left(\left((a^{-6})^{\frac{1}{4}}\right)^{\frac{1}{9}}\right)^{-12} = a^{-6\times\frac{1}{4}\times\frac{1}{9}\times(-12)} = a^2$

問3の解答

(1) $(2^{2+7} \times 5^{5+4})^{\frac{1}{9}} = 2 \times 5 = 10$

(2) $(2^3 \times 3^2)^{\frac{1}{5}} \times (2^2 \times 3^3)^{\frac{1}{5}} = (2^5 \times 3^5)^{\frac{1}{5}} = 2 \times 3 = 6$

< 分数乗の微分 1 > (33ページ)

問の解答

$\sqrt[4]{x+h} = a,\ \sqrt[4]{x} = b$

$x + h = a^4,\ x = b^4$

$h = a^4 - b^4$

$$\lim_{h\to 0} \frac{\sqrt[4]{x+h} - \sqrt[4]{x}}{h} = \lim_{a\to b} \frac{a-b}{a^4-b^4} = \lim_{a\to b} \frac{1}{a^3+a^2b+ab^2+b^3}$$

$$= \frac{1}{b^3+b^3+b^3+b^3} = \frac{1}{4b^3}$$

$$= \frac{1}{4\sqrt[4]{x^3}}$$

< 分数乗の微分 2 > (34ページ)

問の解答

(1) $\left(x^{\frac{3}{2}}\right)' = \frac{3}{2}x^{\frac{1}{2}} = \frac{3}{2}\sqrt{x}$

(2) $\left(x^{\frac{6}{5}}\right)' = \frac{6}{5}\sqrt[5]{x}$

(3) $\left(x^{\frac{3}{5}}\right)' = \frac{3}{5}x^{-\frac{2}{5}} = \frac{3}{5\sqrt[5]{x^2}}$

(4) $\left(x^{\frac{4}{7}}\right)' = \frac{4}{7\sqrt[7]{x^3}}$

< 分数乗の不定積分 > (35ページ)

問の解答

(1) $\frac{2}{3}x\sqrt{x}+C$

(2) $\frac{4}{5}x\sqrt[4]{x}+C$

(3) $\frac{3}{7}x^2\sqrt[3]{x}+C$

(4) $\frac{2}{5}x^2\sqrt{x}+C$

(5) $\int x^{-\frac{1}{4}}dx=\frac{4}{3}x^{\frac{3}{4}}+C=\frac{4}{3}\sqrt[4]{x^3}+C$

(6) $\int x^{-\frac{3}{5}}dx=\frac{5}{2}x^{\frac{2}{5}}+C=\frac{5}{2}\sqrt[5]{x^2}+C$

(7) $-\frac{2}{\sqrt{x}}+C$

(8) $\int x^{-\frac{7}{3}}dx=-\frac{3}{4}x^{-\frac{4}{3}}+C=-\frac{3}{4x\sqrt[3]{x}}+C$

< 分数乗の定積分 > (36 ページ)

問の解答

(1) $\left[\frac{2}{3}x\sqrt{x}\right]_1^4 = \frac{2}{3}\left(4\sqrt{4}-1\right) = \frac{14}{3}$

(2) $\left[\frac{3}{4}x\sqrt[3]{x}\right]_8^{27} = \frac{3}{4}\left(27\sqrt[3]{27}-8\sqrt[3]{8}\right) = \frac{195}{4}$

(3) $\left[\frac{2}{5}x^2\sqrt{x}\right]_0^4 = \frac{2}{5}\times 4^2\sqrt{4} = \frac{64}{5}$

(4) $\left[-\frac{1}{x}\right]_1^4 = -\frac{1}{4}+1 = \frac{3}{4}$

(5) $\left[\frac{3}{2}x^{\frac{2}{3}}\right]_1^8 = \frac{3}{2}\left(8^{\frac{2}{3}}-1\right) = \frac{9}{2}$

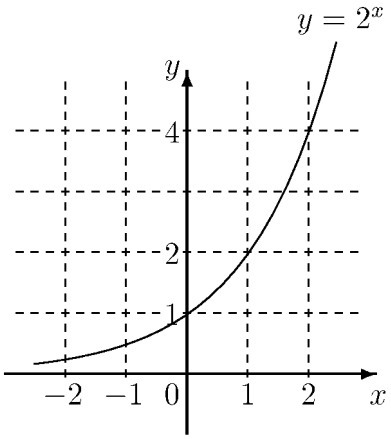
(6) $\int_9^1 x^{-\frac{3}{2}}dx = \left[-2x^{-\frac{1}{2}}\right]_9^1 = -2\left(1-\frac{1}{\sqrt{9}}\right) = -2\times\frac{2}{3} = -\frac{4}{3}$

< 指数関数 > (37ページ)

問の解答

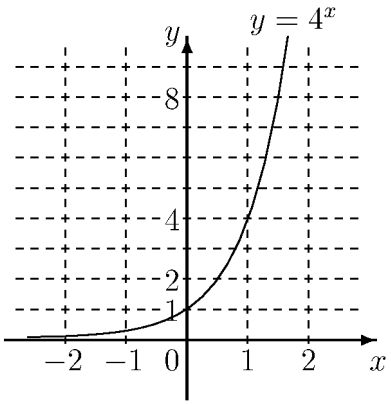
(1) $y = 2^x$

x	-2	-1	0	$\frac{1}{2}$	1	2
y	$\frac{1}{4}$	$\frac{1}{2}$	1	$\sqrt{2}$	2	4



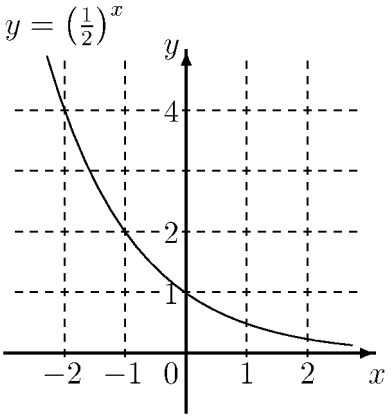
(2) $y = 4^x$

x	-1	$-\frac{1}{2}$	0	$\frac{1}{2}$	1	$\frac{3}{2}$
y	$\frac{1}{4}$	$\frac{1}{2}$	1	2	4	8



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

x	-2	-1	0	1	2
y	4	2	1	$\frac{1}{2}$	$\frac{1}{4}$



< 指数方程式 > (38 ページ)

問の解答

(1) $x = 0$ (2) $x = 1$ (3) $x = 2$ (4) $x = -1$

(5) $x = \dfrac{1}{2}$ (6) $x = 0$ (7) $x = 2$ (8) $x = \dfrac{1}{3}$

(9) $x = -1$ (10) $x = -2$ (11) $x = 0$ (12) $x = 3$

(13) $x = 6$ (14) $x = \dfrac{3}{5}$ (15) $x = \dfrac{3}{2}$ (16) $x = -1$

(17) $x = -3$ (18) $x = -2$ (19) $x = -\dfrac{1}{2}$ (20) $x = 0$

(21) $x = 1$ (22) $x = 3$ (23) $x = 2$ (24) $x = -1$

(25) $x = -3$ (26) $x = -\dfrac{1}{2}$ (27) $x = 0$ (28) $x = 3$

(29) $x = \dfrac{1}{2}$ (30) $x = \dfrac{3}{2}$ (31) $x = -1$ (32) $x = \dfrac{1}{4}$

$<$ 対数 1 $>$ (39ページ)

問1の解答

(1) $\log_2 \sqrt{2} = \dfrac{1}{2}$

(2) $\log_3 \left(\dfrac{1}{3}\right) = -1$

(3) $64 = 4^3$

(4) $32 = 4^{\frac{5}{2}}$

問2の解答

(1) 4

(2) 4

(3) 3

(4) 2

< 対数 2 > (40 ページ)

問 1 の解答

(1) 5　(2) $\frac{1}{2}$　(3) -1

(4) $\frac{3}{2}$　(5) 0　(6) -2

(7) $\frac{1}{4}$　(8) -1　(9) $\frac{3}{2}$

(10) $\frac{3}{2}$　(11) $-\frac{1}{2}$　(12) $\frac{5}{2}$

問 2 の解答

(1) $\log_2\left(2^\alpha \times 2^\beta\right) = \log_2\left(2^{\alpha+\beta}\right) = \alpha + \beta$

(2) $\log_2\left(2^\alpha\right) + \log_2\left(2^\beta\right) = \alpha + \beta$