< 1ページ. 一般角 >

解答　(1) $\sin 90^\circ$　(2) $\cos 270^\circ$　(3) $\tan 150^\circ$

(4) $\sin 120^\circ$　(5) $\cos 240^\circ$　(6) $\tan 130^\circ$

＜ 2 ページ. 三角関数の性質 1 ＞

問 1 の解答

(1) $-\sin\theta$　(2) $-\cos\theta$　(3) $\tan\theta$

問 2 の解答

(1) $-\sin\theta$　(2) $\cos\theta$　(3) $-\tan\theta$

＜ 3 ページ. 三角関数の性質 2 ＞

問 1 の解答

(1) $\cos\theta$　　(2) $\sin\theta$

問 2 の解答

(1) $\sin 200^\circ = \sin(180^\circ + 20^\circ) = -\sin 20^\circ = -0.342$

$\cos 200^\circ = -\cos 20^\circ = -0.9397$

$\tan 200^\circ = \tan 20^\circ = 0.364$

(2) $\sin(-20^\circ) = -\sin 20^\circ = -0.342$

$\cos(-20^\circ) = \cos 20^\circ = 0.9397$

$\tan(-20^\circ) = -\tan 20^\circ = -0.364$

(3) $\sin 70^\circ = \sin(90^\circ - 20^\circ) = \cos 20^\circ = 0.9397$

$\cos 70^\circ = \sin 20^\circ = 0.342$

< 4ページ. 三角関数の性質3 >

問1の解答

$$\tan\theta = \frac{\sin\theta}{\cos\theta}$$

問2の解答

θ	第1象限	第2象限	第3象限	第4象限
$\sin\theta$	$+$	$+$	$-$	$-$
$\cos\theta$	$+$	$-$	$-$	$+$
$\tan\theta$	$+$	$-$	$+$	$-$

問3の解答

$$\sin\theta^2 = 1 - \cos^2\theta = 1 - \frac{16}{25} = \frac{9}{25}$$

$$\sin\theta = \pm\frac{3}{5}$$

＜ 5ページ. 極座標 ＞

解答 (1) $(3,\ 3)=\left(3\sqrt{2}\cos 45^\circ\ ,\ \ 3\sqrt{2}\sin 45^\circ\right)=\left(3\sqrt{2}\cos\left(\dfrac{\pi}{4}\right)\ ,\ \ 3\sqrt{2}\sin\left(\dfrac{\pi}{4}\right)\right)$

(2) $(-1,\ \sqrt{3})=\left(2\cos\left(\dfrac{2\pi}{3}\right)\ ,\ \ 2\sin\left(\dfrac{2\pi}{3}\right)\right)$

(3) $(\sqrt{3},\ -1)=\left(2\cos\left(-\dfrac{\pi}{6}\right)\ ,\ \ 2\sin\left(-\dfrac{\pi}{6}\right)\right)=\left(2\cos\left(\dfrac{11\pi}{6}\right)\ ,\ \ 2\sin\left(\dfrac{11\pi}{6}\right)\right)$

(4) $(-2,\ -2\sqrt{3})=\left(4\cos\left(-\dfrac{2}{3}\pi\right)\ ,\ \ 4\sin\left(-\dfrac{2}{3}\pi\right)\right)=\left(4\cos\left(\dfrac{4}{3}\pi\right)\ ,\ \ 4\sin\left(\dfrac{4}{3}\pi\right)\right)$

(注) $\dfrac{2\pi}{3}=120^\circ$, $\dfrac{\pi}{6}=30^\circ$, $\dfrac{4\pi}{3}=240^\circ$ で表してもよい。

＜ 6ページ. 余弦定理１ ＞

解答 (1) $\mathrm{P}(a,\,0)$, $\mathrm{Q}(b\cos\theta,\ b\sin\theta)$

(2) $\mathrm{PQ}^2=(b\cos\theta-a)^2+(b\sin\theta)^2$

(3) $$\begin{aligned}\mathrm{PQ}^2&=b^2\cos^2-2ab\cos\theta+a^2+b^2\sin^2\theta\\&=b^2-2ab\cos\theta+a^2\end{aligned}$$

(4) $c^2=a^2+b^2-2ab\cos\theta$

< 7ページ. 余弦定理 2 >

問 1 の解答

$$c^2 = a^2 + b^2 - 2ab\cos\theta$$

問 2 の解答

$$
\begin{aligned}
(1)\ c^2 &= 3^2 + 5^2 - 2 \times 3 \times 5 \times \cos 60^\circ \\
&= 9 + 25 - 15 = 19 \\
c &= \sqrt{19}
\end{aligned}
$$

$$
\begin{aligned}
(2)\ c^2 &= (3\sqrt{2})^2 + 4^2 - 2 \times 3\sqrt{2} \times 4 \times \cos(135^\circ) \\
&= 9 \times 2 + 16 + 24 = 58 \\
c &= \sqrt{58}
\end{aligned}
$$

＜ 8 ページ. 加法定理 1 ＞

解答 (1) $\mathrm{Q}(\cos\beta\ ,\ \sin\beta)$

(2) $\mathrm{P}(\cos\alpha\ ,\ -\sin\alpha)$

(3) $\mathrm{PQ}^2 = (\cos\beta - \cos\alpha)^2 + (\sin\beta + \sin\alpha)^2$

(4) $\mathrm{PQ}^2 = \cos^2\beta - 2\cos\alpha\cos\beta + \cos^2\alpha + \sin^2\beta + 2\sin\alpha\sin\beta + \sin^2\alpha$

$= 2 - 2\cos\alpha\cos\beta + 2\sin\alpha\sin\beta$

(5) $\mathrm{PQ}^2 = 1^2 + 1^2 - 2\cos(\alpha + \beta)$

(6) $\cos(\alpha + \beta) = \cos\alpha\cos\beta - \sin\alpha\sin\beta$

$<$ 9ページ. 加法定理 2 $>$

解答

$$
\begin{aligned}
\cos 105^\circ &= \cos(60^\circ + 45^\circ) = \cos 60^\circ \cos 45^\circ - \sin 60^\circ \sin 45^\circ \\
&= \frac{1}{2} \times \frac{\sqrt{2}}{2} - \frac{\sqrt{3}}{2} \times \frac{\sqrt{2}}{2} = \frac{\sqrt{2} - \sqrt{6}}{4}
\end{aligned}
$$

$$
\begin{aligned}
\sin 105^\circ &= \cos(90^\circ + 105^\circ) = \cos\bigl((90^\circ - 60^\circ) + (-45^\circ)\bigr) \\
&= \cos(90^\circ - 60^\circ)\cos(-45^\circ) - \sin(90^\circ - 60^\circ)\sin(-45^\circ) \\
&= \cos 30^\circ \cos 45^\circ + \sin 30^\circ \sin 45^\circ \\
&= \frac{\sqrt{3}}{2} \times \frac{\sqrt{2}}{2} + \frac{1}{2} \times \frac{\sqrt{2}}{2} = \frac{\sqrt{6} + \sqrt{2}}{4}
\end{aligned}
$$

< 10ページ. 加法定理3 >

問1の解答

$$\sin(\alpha+\beta)=\sin\alpha\cos\beta+\cos\alpha\sin\beta$$

問2の解答

(1) $$\cos 165^\circ=\cos(90^\circ+75^\circ)=\cos 90^\circ\cos 75^\circ-\sin 90^\circ\sin 75^\circ$$
$$=-\sin 75^\circ=-\frac{\sqrt{6}+\sqrt{2}}{4}$$

(2) $$\sin 165^\circ=\sin(90^\circ+75^\circ)=\sin 90^\circ\cos 75^\circ+\cos 90^\circ\sin 75^\circ$$
$$=\cos 75^\circ=\frac{\sqrt{6}-\sqrt{2}}{4}$$

問3の解答

(1) $$\cos(\alpha-\beta)=\cos\alpha\cos\beta+\sin\alpha\sin\beta$$

(2) $$\sin(\alpha-\beta)=\sin\alpha\cos\beta-\cos\alpha\sin\beta$$

＜ 11ページ. 加法定理4 ＞

問1の解答

$$\tan 105^\circ = \frac{\sin 105^\circ}{\cos 105^\circ} = \frac{\frac{\sqrt{2}+\sqrt{6}}{4}}{\frac{\sqrt{2}-\sqrt{6}}{4}} = \frac{\sqrt{2}+\sqrt{6}}{\sqrt{2}-\sqrt{6}} = \frac{(\sqrt{2}+\sqrt{6})^2}{(\sqrt{2}-\sqrt{6})(\sqrt{2}+\sqrt{6})}$$

$$= \frac{2+2\sqrt{12}+6}{2-6} = -\frac{8+4\sqrt{3}}{4} = -2-\sqrt{3}$$

問2の解答

$$\tan(\alpha+\beta) = \frac{\tan\alpha+\tan\beta}{1-\tan\alpha\tan\beta}$$

< 12ページ. 累乗根１ >

解答 (1) $\sqrt{121} = 11$　　(2) $\sqrt[3]{27} = 3$　　(3) $\sqrt[3]{64} = 4$

(4) $\sqrt[4]{16} = 2$　　(5) $\sqrt[4]{\dfrac{81}{256}} = \dfrac{3}{4}$　　(6) $\sqrt[5]{243} = 3$

＜ 13 ページ. 累乗根 2 ＞

解答 (1) $\sqrt[3]{5} \times \sqrt[3]{7} = \sqrt[3]{35}$ (2) $\sqrt[4]{7} \times \sqrt[4]{10} = \sqrt[4]{70}$

(3) $\dfrac{\sqrt[3]{6}}{\sqrt[3]{24}} = \sqrt[3]{\dfrac{6}{24}} = \sqrt[3]{\dfrac{1}{4}}$ (4) $\dfrac{\sqrt[5]{36}}{\sqrt[5]{12}} = \sqrt[5]{\dfrac{36}{12}} = \sqrt[5]{3}$

＜ 14 ページ. 累乗根 3 ＞

問 1 の解答

(1) $\sqrt[3]{48} = \sqrt[3]{8 \times 6} = 2\sqrt[3]{6}$

(2) $\sqrt[4]{80} = \sqrt[4]{16 \times 5} = 2\sqrt[4]{5}$

(3) $\sqrt[4]{64} = \sqrt[4]{16 \times 4} = 2\sqrt[4]{4} = 2\sqrt{2}$

問 2 の解答

(1) $\left(\sqrt[4]{25}\right)^2 = \sqrt{25} = 5$

(2) $\sqrt[3]{27^2} = \left(\sqrt[3]{27}\right)^2 = 3^2 = 9$

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

(4) $\sqrt[5]{32^3} = \left(\sqrt[5]{32}\right)^3 = 2^3 = 8$

＜ 15 ページ. 整数指数 ＞

解答 (1) $1^0 = 1$　　(2) $2^{-1} = \dfrac{1}{2}$　　(3) $3^{-2} = \dfrac{1}{9}$　　(4) $4^{-3} = \dfrac{1}{64}$

(5) $2^8 \times 4^{-3} = 2^8 \times 2^{-6} = 2^2 = 4$

(6) $9^3 \times 27^{-2} = \left(3^2\right)^3 \times \left(3^3\right)^{-2} = 3^6 \times 3^{-6} = 3^0 = 1$

(7) $\left(3^2\right)^{-1} = \dfrac{1}{3^2} = \dfrac{1}{9}$　　(8) $\left(4^{-1}\right)^3 = \left(\dfrac{1}{4}\right)^3 = \dfrac{1}{64}$

(9) $\left(2^{-4}\right)^{-1} = 2^4 = 16$

< 16 ページ. 分数指数１ >

解答

(1) $144^{\frac{1}{2}} = 12$　(2) $64^{\frac{2}{3}} = 4^2 = 16$　(3) $81^{\frac{1}{4}} = 3$

(4) $36^{\frac{3}{2}} = 6^3 = 216$　(5) $8^{\frac{4}{3}} = 2^4 = 16$　(6) $16^{\frac{5}{4}} = 2^5 = 32$

(7) $25^{-\frac{1}{2}} = \dfrac{1}{\sqrt{25}} = \dfrac{1}{5}$　(8) $27^{-\frac{2}{3}} = \dfrac{1}{\left(\sqrt[3]{27}\right)^2} = \dfrac{1}{9}$

(9) $64^{-\frac{4}{3}} = \dfrac{1}{\left(\sqrt[3]{64}\right)^4} = \dfrac{1}{4^4} = \dfrac{1}{256}$

< 17 ページ. 分数指数 2 >

問 1 の解答

(1) $\sqrt[10]{4^5} = \sqrt{4} = 2$

(2) $\sqrt[12]{5^3} = 5^{\frac{3}{12}} = 5^{\frac{1}{4}} = \sqrt[4]{5}$

(3) $\sqrt[3]{7^6} = 7^{\frac{6}{3}} = 7^2 = 49$

(4) $\sqrt[4]{9^6} = 9^{\frac{6}{4}} = 9^{\frac{3}{2}} = \left(\sqrt{9}\right)^3 = 3^3 = 27$

問 2 の解答

(1) $\sqrt[3]{100} \times \sqrt[6]{100} = 10^{\frac{2}{3}} \times 10^{\frac{2}{6}} = 10^{\frac{4+2}{6}} = 10$

(2) $\dfrac{\sqrt[3]{4}}{\sqrt[6]{4}} = 4^{\frac{1}{3}} \times 4^{-\frac{1}{6}} = 4^{\frac{1}{6}} = \left(2^2\right)^{\frac{1}{6}} = 2^{\frac{1}{3}} = \sqrt[3]{2}$

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

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

$<$ 18ページ. 指数法則 $>$

問1の解答

正の数 a と b、および有理数 p と q に対して

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

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

問2の解答

(1) $\sqrt[3]{a} \times \sqrt[3]{a^5} = \sqrt[3]{a^6} = a^2$

(2) $\sqrt[4]{a^5} \div \sqrt[4]{a} = a^{\frac{5}{4}} \times a^{-\frac{1}{6}} = a$

(3) $\left(\sqrt[3]{a}\right)^4 \times \sqrt[3]{a^8} = a^{\frac{4}{3}} \times a^{\frac{8}{3}} = a^{\frac{12}{3}} = a^4$

(4) $\sqrt[3]{a^5} \div \left(\sqrt[3]{a}\right)^2 = a^{\frac{5}{3}} \times a^{-\frac{2}{3}} = a$

(5) $\left(\sqrt[3]{a}\right)^{\frac{6}{5}} = \left(a^{\frac{1}{3}}\right)^{\frac{6}{5}} = a^{\frac{2}{5}} \ \left(= \sqrt[5]{a^2}\right)$

(6) $\left(\sqrt[4]{\sqrt[3]{a^{-2}}}\right)^3 = \left(\left(\left(a^{-2}\right)^{\frac{1}{3}}\right)^{\frac{1}{4}}\right)^3 = a^{-2\times\frac{1}{3}\times\frac{1}{4}\times 3} = a^{-\frac{1}{2}} = \dfrac{1}{\sqrt{a}}$

問3の解答

(1) $(5^4 \times 7^2)^{\frac{1}{3}} \times (5^2 \times 7^4)^{\frac{1}{3}} = 5^{\frac{4}{3}} \times 7^{\frac{2}{3}} \times 5^{\frac{2}{3}} \times 7^{\frac{4}{3}}$

$= 5^{\frac{4}{3}+\frac{2}{3}} \times 7^{\frac{2}{3}+\frac{4}{3}} = 5^2 \times 7^2 = 25 \times 49 = 1225$

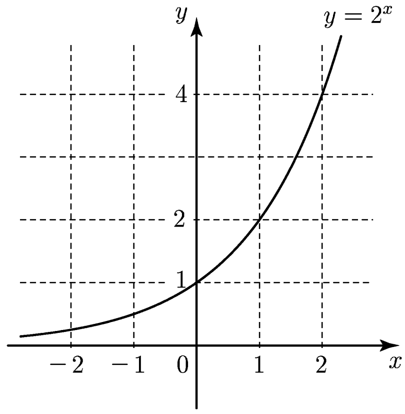
(2) $\sqrt[4]{54} \times \sqrt[4]{24} = \left(2 \times 3^3\right)^{\frac{1}{4}} \times \left(2^3 \times 3\right)^{\frac{1}{4}}$

$= 2^{\frac{1}{4}} \times 3^{\frac{3}{4}} \times 2^{\frac{3}{4}} \times 3^{\frac{1}{4}} = 2^1 \times 3^1 = 6$

＜ 19 ページ. 指数関数 ＞

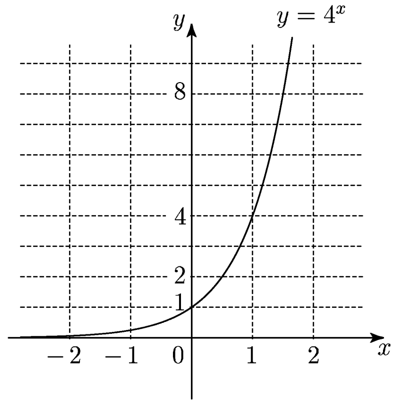
解答 (1) $y = 2^x$

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



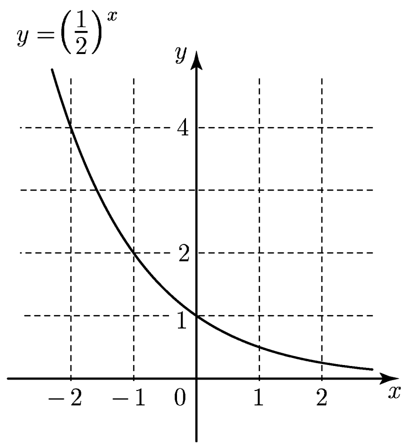
(2) $y = 4^x$

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

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



< 20ページ. 指数方程式 >

解答

(1) $x = 0$	(2) $x = 3$	(3) $x = 4$	(4) $x = -2$
(5) $x = \frac{1}{2}$	(6) $x = 0$	(7) $x = 2$	(8) $x = \frac{3}{2}$
(9) $x = -1$	(10) $x = -2$	(11) $x = 0$	(12) $x = 3$
(13) $x = 6$	(14) $x = \frac{1}{3}$	(15) $x = \frac{5}{4}$	(16) $x = -1$
(17) $x = -3$	(18) $x = -\frac{1}{2}$	(19) $x = -\frac{3}{2}$	(20) $x = 0$
(21) $x = 1$	(22) $x = -\frac{1}{2}$	(23) $x = 3$	(24) $x = -1$
(25) $x = -2$	(26) $x = -\frac{1}{2}$	(27) $x = 0$	(28) $x = \frac{1}{2}$
(29) $x = \frac{3}{2}$	(30) $x = \frac{5}{2}$	(31) $x = -1$	(32) $x = \frac{1}{4}$

$<$ 21 ページ. 対数 1 $>$

問 1 の解答

(1) $\frac{1}{2} = \log_3 \sqrt{3}$　　(2) $-1 = \log_{10} 0.1$　　(3) $32 = 2^5$

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

問 2 の解答

(1) 5　　(2) 3　　(3) 4　　(4) 3

< 22ページ. 対数2 >

問1の解答

(1) 6　　(2) $\dfrac{1}{2}$　　(3) -1

(4) $\dfrac{3}{2}$　　(5) 3　　(6) 0

(7) $\dfrac{1}{3}$　　(8) -1　　(9) -2

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

問2の解答

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

< 23ページ. 対数 3 >

問 1 の解答

(1) $\alpha - \beta$　　(2) $\alpha - \beta$

問 2 の解答

(1) $4\log_2 M$　　(2) $5\log_2 M$

問 3 の解答

(1) $\log_2\bigl((2^\alpha)^r\bigr) = \alpha r$　　(2) $r \times \alpha$

問 4 の解答

$\log_2 M - \log_2 N$

＜ 24 ページ. 対数 4 ＞

問 1 の解答

$$\log_a\left(\frac{M}{N}\right) = \log_a M - \log_a N$$

問 2 の解答

$$\log_a\left(M^r\right) = r \times \log_a M$$

問 3 の解答

(1) $\log_2\left(\frac{12}{3}\right) = \log_2 4 = 2$

(2) $\log_3\left(18 \times \frac{9}{2}\right) = \log_3(9 \times 9) = 4$

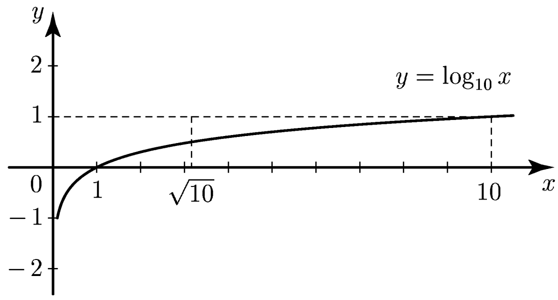
(3) $\log_6(18 \times 2^2 \times 3) = \log_6(6 \times 3 \times 2^2 \times 3) = \log_6(6^3) = 3$

(4) $\log_{10}(40 \times 250 \times 0.1) = \log_{10}(1000) = 3$

< 25 ページ. 対数関数 >

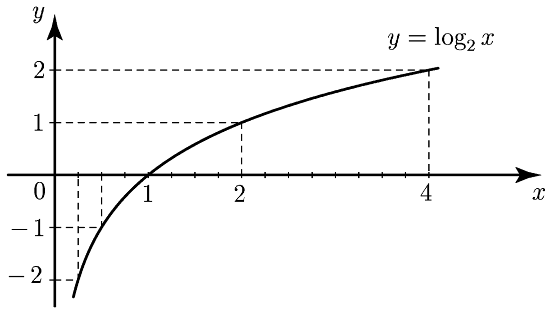
解答 (1)

x	0.1	1	$\sqrt{10}$	10
y	-1	0	$\frac{1}{2}$	1



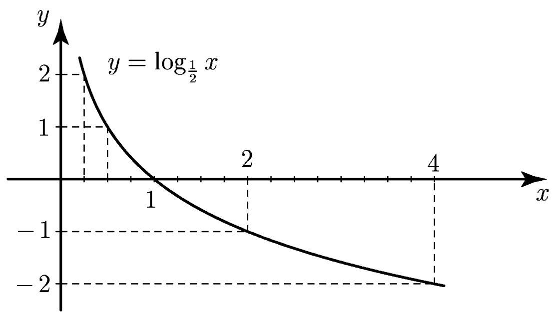
(2)

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



(3)

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



< 26 ページ. 関数の値 >

問 1 の解答

(1) $f(0) = 5$, $f(1) = 3$, $f(2) = 3$

(2) $f(1) = -1$, $f(2) = 4$, $f(3) = 21$

(3) $f(-3) = \dfrac{1}{4}$, $f(0) = 2$, $f(3) = 16$

(4) $f(0) = 0$, $f(1) = 2$, $f(5) = 4$

問 2 の解答

(1) $f(a) = a^3$, $f(a+h) = (a+h)^3$

(2) $f(a) = 4a + 5$, $f(a+h) = 4(a+h) + 5$

(3) $f(a) = 2a^2 - 3$, $f(a+h) = 2(a+h)^2 - 3$

(4) $f(a) = 5a^2 + 6a$, $f(a+h) = 5(a+h)^2 + 6(a+h)$

< 27 ページ. 接線 >

解答 (1) $\dfrac{(1+h)^2-1}{h} = \dfrac{1+2h+h^2-1}{h} = \dfrac{2h+h^2}{h} = 2+h$

(2) $2+0.1=2.1$

(3) $2+0.01=2.01$

＜ 28 ページ. 極限 1 ＞

解答 (1) $\displaystyle \lim_{h \to 0} \frac{16 + 8h + h^2 - 16}{h} = \lim_{h \to 0}(8 + h) = 8$

(2) $\displaystyle \lim_{h \to 0} \frac{25 + 10h + h^2 - 25}{h} = \lim_{h \to 0}(10 + h) = 10$

< 29ページ. 極限 2 >

問 1 の解答

(1) $\displaystyle \lim_{h \to 0} \frac{5(1+2h+h^2)-5}{h} = 10$

(2) $\displaystyle \lim_{h \to 0} \frac{3(4+4h+h^2)-12}{h} = 12$

(3) $\displaystyle \lim_{h \to 0} \frac{1+3h+3h^2+h^3-1}{h} = 3$

(4) $\displaystyle \lim_{h \to 0} \frac{27+27h+9h^2+h^3-27}{h} = 27$

問 2 の解答

(1) $\displaystyle \lim_{h \to 0} \frac{3h}{h} = 3$

(2) $\displaystyle \lim_{h \to 0} \frac{a^2+2ah+h^2-a^2}{h} = 2a$

(3) $\displaystyle \lim_{h \to 0} \frac{a^3+3a^2h+3ah^3+h^3-a^3}{h}$

$\displaystyle = \lim_{h \to 0}(3a^2+3ah+h^2) = 3a^2$

< 30 ページ. 接線の傾き >

解答 (1) $2a = 2 \times 3 = 6$

(2) $2a = 2 \times 0 = 0$

(3) $2a = 2 \times (-2) = -4$

$<$ 31ページ. 微分係数１ $>$

問１の解答

(1) 3　　　(2) 0　　　(3) 3

問２の解答

(1) $f'(a) = 2a$　　　(2) $f'(a) = 3a^2$

< 32ページ. 微分係数 2 >

解答 (1) $6a$　　(2) $2a + 1$　　(3) $2a - 3$

$<$ 33ページ. 導関数１ $>$

解答 (1) $2x$ (2) $3x^2$ (3) $6x$ (4) $2x+1$

< 34ページ. 導関数２ >

問１の解答

(1)　0　　(2)　3

問２の解答

(1)　0　　(2)　2　　(3)　3

(4)　$6x$　　(5)　$2x+1$　　(6)　$2x-4$

< 35 ページ. 導関数 3 >

解答 (1) $3x^2$ (2) $8x - 9x^2$

(3) $4x - 5$ (4) $15x^2 - 12x + 7$

< 36ページ. 関数の増減１ >

解答 (1) $y' = -2x^2 + 2$　, 頂点 $(1,\ 4)$

x	$x < 1$	1	$1 < x$
y'	$+$	0	$-$
y	$\nearrow$	4	$\searrow$

(2) $y' = 2x + 4$　, 頂点 $(-2,\ -7)$

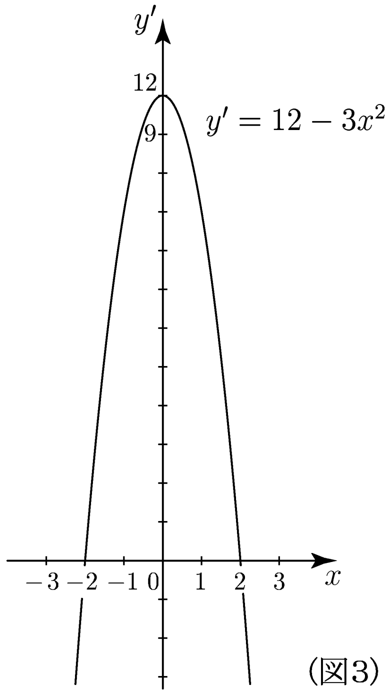
x	$x < -2$	-2	$-2 < x$
y'	$-$	0	$+$
y	$\searrow$	-7	$\nearrow$

＜ 37 ページ. 関数の増減 2 ＞

解答

x	$x<-2$	-2	$-2<x<2$	2	$2<x$
y'	$-$	0	$+$	0	$-$
y	↘	-16	↗	16	↘

$y' = 12 - 3x^2$



(図3)

＜ 38 ページ. 関数の増減 3 ＞

解答 (1) $y = -x^3 + 3x^2$, $y' = -3x^2 + 6x = -3x(x-2)$

x	$x < 0$	0	$0 < x < 2$	2	$2 < x$
y'	$-$	0	$+$	0	$-$
y	$\searrow$	0	$\nearrow$	4	$\searrow$

(2) $y = x^3 - 6x^2 + 9x$, $y' = 3x^2 - 12x + 9 = 3(x^2 - 4x + 3)$

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

x	$x < 1$	1	$1 < x < 3$	3	$3 < x$
y'	$+$	0	$-$	0	$+$
y	$\nearrow$	4	$\searrow$	0	$\nearrow$

＜ 39 ページ. 最大・最小１ ＞

解答

x	0	$\cdots$	2	$\cdots$	4
y'	╳	$-$	0	$+$	╳
y	1	$\searrow$	-3	$\nearrow$	17

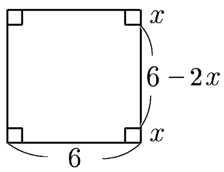
$$y' = 3x^2 - 6x = 3x(x-2)$$

(答) $x = 4$ のとき最大値 $y = 17$

$x = 2$ のとき最小値 $y = -3$

< 40ページ. 最大・最小2 >

解答



$$y = x \times (6-2x)^2$$
$$= x \times (36 - 24x + 4x^2)$$
$$= 4x^3 - 24x^2 + 36x$$

$$y' = 12x^2 - 48x + 36$$
$$= 12(x^2 - 4x + 3)$$
$$= 12(x-1)(x-3)$$

x	0	$\cdots$	1	$\cdots$	3
y'	╳	$+$	0	$-$	╳
y	0	↗	16	↘	0

x の範囲　$0 < x < 3$

(答)　$x = 1$(cm) のとき 最大容積 16(cm^3) をとる