4章 問題解答一覧

1節 三角比

●練習 1

(1) $\sin A = \frac{5}{13}$, $\cos A = \frac{12}{13}$, $\tan A = \frac{5}{12}$

(2) $\sin A = \frac{7}{25}$, $\cos A = \frac{24}{25}$, $\tan A = \frac{7}{24}$

(3) $\sin A = \frac{1}{\sqrt{5}}$, $\cos A = \frac{2}{\sqrt{5}}$, $\tan A = \frac{1}{2}$

●練習 2

(1) $\sin A = \frac{8}{17}$, $\cos A = \frac{15}{17}$, $\tan A = \frac{8}{15}$

(2) $\sin A = \frac{2}{\sqrt{13}}$, $\cos A = \frac{3}{\sqrt{13}}$, $\tan A = \frac{2}{3}$

(3) $\sin A = \frac{\sqrt{15}}{4}$, $\cos A = \frac{1}{4}$, $\tan A = \sqrt{15}$

●練習 3

(1) $\sin 74° = 0.9613$

(2) $\cos 23° = 0.9205$

(3) $\tan 50° = 1.1918$

●練習 4

(1) $A = 29°$

(2) $A = 83°$

(3) $A = 23°$

●練習 5

(1) $A \fallingdotseq 37°$

(2) $A \fallingdotseq 76°$

●練習 6

鉛直方向 20.8 m

水平方向 97.8 m

●練習 7

17.8 m

●練習 8

213.5 m

●練習 9

(1) $\cos A = \frac{12}{13}$, $\tan A = \frac{5}{12}$

(2) $\sin A = \frac{2}{3}$, $\tan A = \frac{2}{\sqrt{5}}$

●練習 10

$\sin A = \frac{4}{\sqrt{17}}$, $\cos A = \frac{1}{\sqrt{17}}$

●練習 11

(1) $\cos 27°$

(2) $\sin 5°$

(3) $\frac{1}{\tan 14°}$

●練習 12

1

●練習 13

(1) $\sin 135° = \frac{1}{\sqrt{2}}$, $\cos 135° = -\frac{1}{\sqrt{2}}$,

$\tan 135° = -1$

(2) $\sin 150° = \frac{1}{2}$, $\cos 150° = -\frac{\sqrt{3}}{2}$,

$\tan 150° = -\frac{1}{\sqrt{3}}$

●練習 14

θ	0°	30°	45°	60°	90°	120°	135°	150°	180°
$\sin\theta$	0	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{\sqrt{3}}{2}$	1	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	0
$\cos\theta$	1	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	0	$-\frac{1}{2}$	$-\frac{1}{\sqrt{2}}$	$-\frac{\sqrt{3}}{2}$	-1
$\tan\theta$	0	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$	／	$-\sqrt{3}$	-1	$-\frac{1}{\sqrt{3}}$	0

●練習 15

(1) $\sin 48°$, 0.7431

(2) $-\cos 15°$, -0.9659

(3) $-\tan 80°$, -5.6713

●練習 16

(1) $\theta = 60°$, $120°$

(2) $\theta = 120°$

●練習 17

(1) $\theta = 135°$

(2) $\theta = 30°$

(3) $\theta = 0°$, $180°$

●練習 18

$\theta \fallingdotseq 76°$

●練習 19

$m = -\sqrt{3}$

●練習 20

(1) $\cos\theta = \frac{1}{\sqrt{5}}$, $\tan\theta = 2$ または

$\cos\theta = -\frac{1}{\sqrt{5}}$, $\tan\theta = -2$

(2) $\sin\theta = \frac{2\sqrt{2}}{3}$, $\tan\theta = -2\sqrt{2}$

●練習 21

(1) $\cos\theta = -\frac{1}{\sqrt{3}}$, $\sin\theta = \frac{\sqrt{6}}{3}$

(2) $\cos\theta = -\frac{2}{\sqrt{13}}$, $\sin\theta = \frac{3}{\sqrt{13}}$

研究　不等式を満たす角θの範囲

●演習 1

(1) $0° \leqq \theta < 60°$

(2) $60° < \theta \leqq 180°$

節末問題 (p.143)

1

(1) $\mathrm{BD} = 2$

(2) $\tan 15° = 2 - \sqrt{3}$

2

75 m

3

[(1), (2)とも$A + B = 180° - C$を利用する]

4

(1) $\cos\theta = \dfrac{2\sqrt{6}}{5}$, $\tan\theta = \dfrac{\sqrt{6}}{12}$

または $\cos\theta = -\dfrac{2\sqrt{6}}{5}$, $\tan\theta = -\dfrac{\sqrt{6}}{12}$

(2) $\cos\theta = -\dfrac{\sqrt{5}}{5}$, $\sin\theta = \dfrac{2\sqrt{5}}{5}$

5

(1) $\theta = 45°,\ 135°$

(2) $\theta = 45°$

(3) $\theta = 150°$

(4) $45° \leqq \theta \leqq 135°$

(5) $0° \leqq \theta < 60°,\ 120° < \theta \leqq 180°$

(6) $150° \leqq \theta \leqq 180°$

Progress

$$1 + \frac{1}{\tan^2\theta} = \frac{1}{\sin^2\theta}$$

2 節 三角比と図形の計量

●練習 1

(1) $a = 6\sqrt{2},\ R = 6$

(2) $b = 2\sqrt{6},\ R = 2\sqrt{2}$

●練習 2

(1) $c = 7$

(2) $b = \sqrt{31}$

●練習 3

(1) $a = 2$

(2) $c = 3,\ 5$

●練習 4

$A = 120°$

●練習 5

鈍角三角形

●練習 6

$c = 2,\ A = 30°,\ B = 105°$

●問 1

略

●練習 7

$A = 60°,\ C = 75°,\ c = 1 + \sqrt{3}$ または

$A = 120°,\ C = 15°,\ c = -1 + \sqrt{3}$

●練習 8

(1) 6

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

●練習 9

$S = 6\sqrt{6}$

●練習 10

$\mathrm{AD} = \dfrac{20}{9}$

●練習 11

(1) $\mathrm{AC} = \sqrt{10}$

(2) $\mathrm{CD} = 4$

(3) $S = 7$

●練習 12

$r = \dfrac{\sqrt{15}}{2}$

発展　ヘロンの公式

●演習 1

84

●練習 13

(1) $\angle \mathrm{AFC} = 45°$

(2) $S = 3$

●練習 14

(1) $\cos\theta = \dfrac{1}{\sqrt{6}}$

(2) $\mathrm{OH} = \sqrt{5}$

(3) $V = \sqrt{15}$

節末問題（p.158）

1

略

2

(1) $\cos B = \dfrac{5}{9}$

(2) $\mathrm{AM} = 2\sqrt{2}$

3

$S = 2\sqrt{2}$

4

(1) $\angle \mathrm{ABC} = 120°$

(2) $R = \sqrt{7}$

(3) $\dfrac{S_2}{S_1} = 12$

Progress

$\dfrac{6}{7}$

研究　曲面上での最短の長さ

●演習 1

$\sqrt{130}$

発展　三角形の形状

●演習 1

$\mathrm{AB} = \mathrm{AC}$ の二等辺三角形

章末問題 A (p.161)

1

(1) $\sin\theta\cos\theta = -\frac{3}{8}$

(2) $\sin\theta - \cos\theta = \frac{\sqrt{7}}{2}$

2

[対角線 AC と BD の交点を Pなどとおいて考える。]

3

$\sin A : \sin B : \sin C = 4 : 5 : 6$

$\cos A : \cos B : \cos C = 12 : 9 : 2$

4

(1) $\mathrm{CD} = x - 2$

(2) $\mathrm{AB} = 1 + \sqrt{5}$, $\cos 36° = \frac{1+\sqrt{5}}{4}$

5

(1) $S = \sqrt{61}$

(2) $V = 8$

(3) $h = \frac{24}{\sqrt{61}} = \frac{24\sqrt{61}}{61}$

章末問題 B (p.162)

6

(1) $x = 6$

(2) $2 < x < 6$

(3) $x = 3$

7

(1) $41 - 40\cos\alpha$

(2) $29 - 20\cos\beta$

(3) $\cos\alpha = \frac{1}{5}$, $\mathrm{AC} = \sqrt{33}$

(4) $S = 6\sqrt{6}$

8

(1) $V = \frac{\sqrt{2}}{12}$

(2) $S = \sqrt{3}$

(3) $r = \frac{\sqrt{6}}{12}$