



練習 29

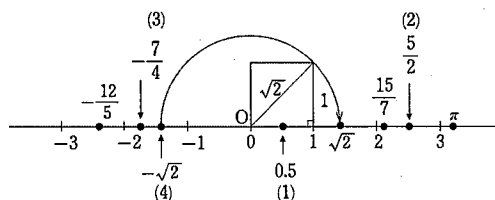
数の範囲	加法	減法	乗法	除法
自然数	○	×	○	×
整数	○	○	○	×
有理数	○	○	○	○
実数	○	○	○	○

例 自然数の減法 $1-2=-1$

自然数の除法 $2 \div 3 = \frac{2}{3}$

整数の除法 $-3 \div 5 = -\frac{3}{5}$

練習 30



練習 31

(1) $|3|=3$

(2) $|-4|=4$

(3) $|\frac{2}{3}|=\frac{2}{3}$

練習 32

絶対値が5である数は 5, -5

練習 33

(1) $|2-3|=|-1|=-(-1)=1$

(2) $|1-(-3)|=|1+3|=|4|=4$

(3) $3-\pi$ は負の数であるから
 $|3-\pi|=- (3-\pi)=\pi-3$

練習 34

(1) $\sqrt{6}$ と $-\sqrt{6}$, すなわち $\pm\sqrt{6}$

(2) $\sqrt{16}=\sqrt{4^2}=4$, $-\sqrt{\frac{9}{25}}=-\sqrt{(\frac{3}{5})^2}=-\frac{3}{5}$

練習 35

(1) $\sqrt{2}\sqrt{3}=\sqrt{2 \times 3}=\sqrt{6}$

(2) $\sqrt{2}\sqrt{5}=\sqrt{2 \times 5}=\sqrt{10}$

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

練習 28

(1) $\frac{8}{9}=0.888\dots=0.\dot{8}$

(2) $\frac{6}{11}=0.545454\dots=0.5\dot{4}$

(3) $\frac{10}{27}=0.370370370\dots=0.3\dot{7}\dot{0}$

(4) $\frac{25}{22}=1.1363636\dots=1.1\dot{3}\dot{6}$

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

練習 3 6

- (1) $3\sqrt{2} = \sqrt{3^2 \times 2} = \sqrt{3^2 \times 2} = \sqrt{18}$
- (2) $4\sqrt{3} = \sqrt{4^2 \times 3} = \sqrt{4^2 \times 3} = \sqrt{48}$
- (3) $5\sqrt{5} = \sqrt{5^2 \times 5} = \sqrt{5^2 \times 5} = \sqrt{125}$
- (4) $\frac{\sqrt{3}}{2} = \frac{\sqrt{3}}{\sqrt{2^2}} = \sqrt{\frac{3}{2^2}} = \sqrt{\frac{3}{4}}$

練習 3 7

- (1) $\sqrt{8} = \sqrt{2^2 \times 2} = \sqrt{2^2} \sqrt{2} = 2\sqrt{2}$
- (2) $\sqrt{12} = \sqrt{2^2 \times 3} = \sqrt{2^2} \sqrt{3} = 2\sqrt{3}$
- (3) $\sqrt{50} = \sqrt{5^2 \times 2} = \sqrt{5^2} \sqrt{2} = 5\sqrt{2}$

練習 3 8

- (1) $5\sqrt{3} - 2\sqrt{3} + \sqrt{3} = (5 - 2 + 1)\sqrt{3} = 4\sqrt{3}$
- (2) $\sqrt{2} + \sqrt{32} - \sqrt{72} = \sqrt{2} + 4\sqrt{2} - 6\sqrt{2}$
 $= (1 + 4 - 6)\sqrt{2}$
 $= -\sqrt{2}$
- (3) $(5\sqrt{2} - 3\sqrt{3}) - (2\sqrt{2} + \sqrt{3})$
 $= (5 - 2)\sqrt{2} + (-3 - 1)\sqrt{3}$
 $= 3\sqrt{2} - 4\sqrt{3}$
- (4) $(2\sqrt{5} + 3\sqrt{6}) - (\sqrt{96} - \sqrt{45})$
 $= 2\sqrt{5} + 3\sqrt{6} - 4\sqrt{6} + 3\sqrt{5}$
 $= (2 + 3)\sqrt{5} + (3 - 4)\sqrt{6}$
 $= 5\sqrt{5} - \sqrt{6}$

練習 3 9

- (1) $(4\sqrt{2} + 3\sqrt{5})(2\sqrt{2} - \sqrt{5})$
 $= 4\sqrt{2} \times 2\sqrt{2} - 4\sqrt{2} \sqrt{5} + 3\sqrt{5} \times 2\sqrt{2} - 3\sqrt{5} \sqrt{5}$
 $= 8 \times 2 - 4\sqrt{10} + 6\sqrt{10} - 3 \times 5$
 $= 1 + 2\sqrt{10}$
- (2) $(2\sqrt{3} - \sqrt{6})(\sqrt{3} + 3\sqrt{6})$
 $= 2\sqrt{3} \sqrt{3} + 2\sqrt{3} \times 3\sqrt{6} - \sqrt{6} \sqrt{3} - \sqrt{6} \times 3\sqrt{6}$
 $= 2 \times 3 + 6 \times 3\sqrt{2} - 3\sqrt{2} - 3 \times 6$
 $= -12 + 15\sqrt{2}$
- (3) $(\sqrt{7} + \sqrt{3})^2 = (\sqrt{7})^2 + 2\sqrt{7} \sqrt{3} + (\sqrt{3})^2$
 $= 7 + 2\sqrt{21} + 3$
 $= 10 + 2\sqrt{21}$
- (4) $(\sqrt{6} - 2)^2 = (\sqrt{6})^2 - 2\sqrt{6} \times 2 + 2^2$
 $= 6 - 4\sqrt{6} + 4$
 $= 10 - 4\sqrt{6}$
- (5) $(\sqrt{3} + \sqrt{2})(\sqrt{3} - \sqrt{2}) = (\sqrt{3})^2 - (\sqrt{2})^2$
 $= 3 - 2 = 1$
- (6) $(3 - \sqrt{5})(3 + \sqrt{5}) = 3^2 - (\sqrt{5})^2 = 9 - 5 = 4$

練習 4 0

- (1) $\frac{2}{\sqrt{3}} = \frac{2 \times \sqrt{3}}{\sqrt{3} \times \sqrt{3}} = \frac{2\sqrt{3}}{3}$
- (2) $\frac{4}{\sqrt{2}} = \frac{4 \times \sqrt{2}}{\sqrt{2} \times \sqrt{2}} = \frac{4\sqrt{2}}{2} = 2\sqrt{2}$
- (3) $\frac{\sqrt{3}}{\sqrt{2}} = \frac{\sqrt{3} \times \sqrt{2}}{\sqrt{2} \times \sqrt{2}} = \frac{\sqrt{6}}{2}$
- (4) $\frac{1}{2\sqrt{5}} = \frac{1 \times \sqrt{5}}{2\sqrt{5} \times \sqrt{5}} = \frac{\sqrt{5}}{10}$

練習 4 1

- (1) $\frac{1}{\sqrt{3} + \sqrt{2}} = \frac{\sqrt{3} - \sqrt{2}}{(\sqrt{3} + \sqrt{2})(\sqrt{3} - \sqrt{2})}$
 $= \frac{\sqrt{3} - \sqrt{2}}{(\sqrt{3})^2 - (\sqrt{2})^2} = \frac{\sqrt{3} - \sqrt{2}}{3 - 2} = \sqrt{3} - \sqrt{2}$
- (2) $\frac{\sqrt{2}}{\sqrt{5} - \sqrt{3}} = \frac{\sqrt{2}(\sqrt{5} + \sqrt{3})}{(\sqrt{5} - \sqrt{3})(\sqrt{5} + \sqrt{3})}$
 $= \frac{\sqrt{2}(\sqrt{5} + \sqrt{3})}{(\sqrt{5})^2 - (\sqrt{3})^2} = \frac{\sqrt{2}(\sqrt{5} + \sqrt{3})}{5 - 3} = \frac{\sqrt{2}(\sqrt{5} + \sqrt{3})}{2}$
- (3) $\frac{2\sqrt{3}}{\sqrt{5} + 1} = \frac{2\sqrt{3}(\sqrt{5} - 1)}{(\sqrt{5} + 1)(\sqrt{5} - 1)}$
 $= \frac{2\sqrt{3}(\sqrt{5} - 1)}{(\sqrt{5})^2 - 1^2} = \frac{2\sqrt{3}(\sqrt{5} - 1)}{5 - 1} = \frac{2\sqrt{3}(\sqrt{5} - 1)}{4} = \frac{\sqrt{3}(\sqrt{5} - 1)}{2}$
- (4) $\frac{\sqrt{5} + \sqrt{2}}{\sqrt{5} - \sqrt{2}} = \frac{(\sqrt{5} + \sqrt{2})^2}{(\sqrt{5} - \sqrt{2})(\sqrt{5} + \sqrt{2})}$
 $= \frac{(\sqrt{5})^2 + 2\sqrt{5}\sqrt{2} + (\sqrt{2})^2}{(\sqrt{5})^2 - (\sqrt{2})^2}$
 $= \frac{5 + 2\sqrt{10} + 2}{5 - 2} = \frac{7 + 2\sqrt{10}}{3}$

(p.32) 発展 練習 1

- (1) $\sqrt{7 + 2\sqrt{10}} = \sqrt{(5 + 2) + 2\sqrt{5 \cdot 2}} = \sqrt{5} + \sqrt{2}$
- (2) $\sqrt{12 - 6\sqrt{3}} = \sqrt{12 - 2\sqrt{27}} = \sqrt{(9 + 3) - 2\sqrt{9 \cdot 3}}$
 $= \sqrt{9 - \sqrt{3}} = 3 - \sqrt{3}$
- (3) $\sqrt{2 + \sqrt{3}} = \sqrt{\frac{4 + 2\sqrt{3}}{2}} = \frac{\sqrt{4 + 2\sqrt{3}}}{\sqrt{2}}$
 $= \frac{\sqrt{(3 + 1) + 2\sqrt{3 \cdot 1}}}{\sqrt{2}} = \frac{\sqrt{3} + \sqrt{1}}{\sqrt{2}}$
 $= \frac{\sqrt{6} + \sqrt{2}}{2}$