

中2数学C 2020年度春期 宿題解答

§3 分母の有理化・開平法

H3.1

$$(1) \quad \frac{2}{\sqrt{3}} = \frac{2}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \boxed{\frac{2\sqrt{3}}{3}}$$

$$(2) \quad \frac{\sqrt{3}}{\sqrt{5}} = \frac{\sqrt{3}}{\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}} = \boxed{\frac{\sqrt{15}}{5}}$$

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

$$(4) \quad \frac{5}{2\sqrt{6}} = \frac{5}{2\sqrt{6}} \times \frac{\sqrt{6}}{\sqrt{6}} = \frac{5\sqrt{6}}{2 \times 6} = \boxed{\frac{5\sqrt{6}}{12}}$$

$$(5) \quad \sqrt{\frac{3}{20}} = \frac{\sqrt{3}}{\sqrt{20}} = \frac{\sqrt{3}}{2\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}} = \frac{\sqrt{15}}{2 \times 5} = \boxed{\frac{\sqrt{15}}{10}}$$

$$(6) \quad \frac{36}{\sqrt{27}} = \frac{\overset{12}{\cancel{36}}}{\underset{1}{\cancel{3}}\sqrt{3}} = \frac{12}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{\overset{4}{\cancel{12}}\sqrt{3}}{\underset{1}{\cancel{3}}} = \boxed{4\sqrt{3}}$$

H3.2

$$(1) \quad \frac{3}{\sqrt{5}} + \frac{2\sqrt{5}}{5} = \frac{3}{\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}} + \frac{2\sqrt{5}}{5}$$

$$= \frac{3\sqrt{5}}{5} + \frac{2\sqrt{5}}{5}$$

$$= \frac{\overset{1}{\cancel{3}}\sqrt{5}}{\underset{1}{\cancel{5}}} = \boxed{\sqrt{5}}$$

$$(2) \quad \frac{1}{\sqrt{3}} - \sqrt{\frac{25}{12}} = \frac{1}{\sqrt{3}} - \frac{5}{2\sqrt{3}} \left[\sqrt{\frac{25}{12}} = \frac{\sqrt{25}}{\sqrt{12}} = \frac{5}{2\sqrt{3}} \right]$$

$$= \frac{1}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} - \frac{5}{2\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}}$$

$$= \frac{\sqrt{3}}{3} - \frac{5\sqrt{3}}{2 \times 3}$$

$$= \frac{2\sqrt{3} - 5\sqrt{3}}{6}$$

$$= -\frac{\overset{1}{\cancel{3}}\sqrt{3}}{\underset{2}{\cancel{6}}} = \boxed{-\frac{\sqrt{3}}{2}}$$

$$\begin{aligned}
 (3) \quad \sqrt{\frac{2}{5}} - \frac{3}{\sqrt{10}} + \frac{\sqrt{10}}{2} &= \frac{\sqrt{2}}{\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}} - \frac{3}{\sqrt{10}} \times \frac{\sqrt{10}}{\sqrt{10}} + \frac{\sqrt{10}}{2} \\
 &= \frac{\sqrt{10}}{5} - \frac{3\sqrt{10}}{10} + \frac{\sqrt{10}}{2} \\
 &= \frac{(2-3+5)\sqrt{10}}{10} = \frac{4\sqrt{10}}{10} = \boxed{\frac{2\sqrt{10}}{5}}
 \end{aligned}$$

$$\begin{aligned}
 (4) \quad \frac{\sqrt{2}-3}{\sqrt{3}} - \frac{\sqrt{3}-\sqrt{6}}{\sqrt{2}} &= \frac{\sqrt{2}-3}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} - \frac{\sqrt{3}-\sqrt{6}}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} \\
 &= \frac{\sqrt{6}-3\sqrt{3}}{3} - \frac{\sqrt{6}-2\sqrt{3}}{2} \quad [\sqrt{6} \times \sqrt{2} = \sqrt{2^2 \times 3} = 2\sqrt{3}] \\
 &= \frac{2(\sqrt{6}-3\sqrt{3}) - 3(\sqrt{6}-2\sqrt{3})}{6} \\
 &= \frac{2\sqrt{6} - 6\sqrt{3} - 3\sqrt{6} + 6\sqrt{3}}{6} = \frac{-\sqrt{6}}{6} = \boxed{-\frac{\sqrt{6}}{6}}
 \end{aligned}$$

H3.3

(1) $2\sqrt{3}x + 1 = \sqrt{3}x + 4$ より、

$$2\sqrt{3}x - \sqrt{3}x = 4 - 1$$

$$(2\sqrt{3} - \sqrt{3})x = 3$$

$$\sqrt{3}x = 3$$

$$x = 3 \times \frac{1}{\sqrt{3}} = \sqrt{3} \quad \text{よって、} \boxed{x = \sqrt{3}}$$

(2) $\sqrt{2}x - 3 = \sqrt{18}x + 5$ より、

$$\sqrt{2}x - 3\sqrt{2}x = 5 + 3$$

$$-2\sqrt{2}x = 8$$

$$x = \frac{8}{-2\sqrt{2}} = -\frac{\cancel{8}^4}{\cancel{2}_1 \sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = -\frac{\cancel{4}^2}{\cancel{2}_1} \times \frac{\sqrt{2}}{\sqrt{2}}$$

よって、 $\boxed{x = -2\sqrt{2}}$

H3.4

(1) 右のように開平法で計算すれば、
 $\sqrt{70} = \boxed{8.366} \dots$
となる。

	8. 3 6 6
8	$\sqrt{70}$
8	64
163	6 00
3	4 89
1666	1 11 00
6	99 96
16726	11 04 00
6	10 03 56
	1 00 44

(2) $\sqrt{700} = \boxed{26.457} \dots$

	2 6. 4 5 7
2	$\sqrt{700}$
2	4 00
4 6	3 00
6	2 76
5 2 4	24 00
4	20 96
5 2 8 5	3 04 00
5	2 64 25
5 2 9 0 7	39 75 00
7	37 03 49
	2 71 51

(3) $\sqrt{68.89} = \boxed{8.3}$

	8. 3
8	$\sqrt{68.89}$
8	64
163	4 89
3	4 89
	0