

中2数学X 2019年度1学期 宿題解答

§5 展開・因数分解

H5.1

$$(1) \quad -\sqrt{96} + \sqrt{98} + 2\sqrt{24} - 3\sqrt{32} = -4\sqrt{6} + 7\sqrt{2} + 2 \times 2\sqrt{6} - 3 \times 4\sqrt{2}$$

$$= -4\sqrt{6} + 7\sqrt{2} + 4\sqrt{6} - 12\sqrt{2} = \boxed{-5\sqrt{2}}$$

$$(2) \quad \sqrt{12} \times \sqrt{18} \times \sqrt{21} = 2\sqrt{3} \times 3\sqrt{2} \times \sqrt{21} = 6 \times \sqrt{3 \times 2 \times 3 \times 7} = 6 \times 3\sqrt{14} = \boxed{18\sqrt{14}}$$

$$(3) \quad \sqrt{\frac{5}{3}} + \frac{2\sqrt{3}}{\sqrt{5}} - \frac{\sqrt{60}}{15} = \frac{\sqrt{5} \times \sqrt{3}}{\sqrt{3} \times \sqrt{3}} + \frac{2\sqrt{3} \times \sqrt{5}}{\sqrt{5} \times \sqrt{5}} - \frac{2\sqrt{15}}{15}$$

$$= \frac{\sqrt{15}}{3} + \frac{2\sqrt{15}}{5} - \frac{2\sqrt{15}}{15} = \frac{5\sqrt{15} + 6\sqrt{15} - 2\sqrt{15}}{15} = \frac{9\sqrt{15}}{15} = \boxed{\frac{3\sqrt{15}}{5}}$$

$$(4) \quad \sqrt{24}(\sqrt{27} - \sqrt{72}) - \sqrt{12}(\sqrt{54} - \sqrt{49}) = 2\sqrt{6}(3\sqrt{3} - 6\sqrt{2}) - 2\sqrt{3}(3\sqrt{6} - 7)$$

$$= 2 \times 3 \times \sqrt{6 \times 3} - 2 \times 6 \times \sqrt{6 \times 2} - 2 \times 3 \times \sqrt{3 \times 6} + 14\sqrt{3}$$

$$= 6 \times 3\sqrt{2} - 12 \times 2\sqrt{3} - 6 \times 3\sqrt{2} + 14\sqrt{3}$$

$$= 18\sqrt{2} - 24\sqrt{3} - 18\sqrt{2} + 14\sqrt{3} = \boxed{-10\sqrt{3}}$$

H5.2

$$(1) \quad (a+2b)(2a-3b) = 2a^2 - 3ab + 4ab - 6b^2 = \boxed{2a^2 + ab - 6b^2}$$

$$(2) \quad (a+2b)(a-2b) = a^2 - 2ab + 2ab - 4b^2 = \boxed{a^2 - 4b^2}$$

$$(3) \quad (x+2)(x+4) = x^2 + 4x + 2x + 8 = \boxed{x^2 + 6x + 8}$$

$$(4) \quad (x-6)^2 = (x-6)(x-6) = x^2 - 6x - 6x + 36 = \boxed{x^2 - 12x + 36}$$

$$(5) \quad (\sqrt{2} + \sqrt{6})(2 - \sqrt{3}) = 2\sqrt{2} - \sqrt{6} + 2\sqrt{6} - 3\sqrt{2} = \boxed{-\sqrt{2} + \sqrt{6}}$$

$$(6) \quad (\sqrt{2} + \sqrt{3})^2 = (\sqrt{2} + \sqrt{3})(\sqrt{2} + \sqrt{3}) = 2 + \sqrt{6} + \sqrt{6} + 3 = \boxed{5 + 2\sqrt{6}}$$

H5.3

$$(1) \quad (x+2)(x+\boxed{3})=x^2+\boxed{5}x+6$$

$$(2) \quad (x+\boxed{-1})(x+\boxed{-8})=x^2-9x+8$$

$$(3) \quad (x+\boxed{3})(x+\boxed{-15})=x^2-12x-45$$

$$(4) \quad (x+\boxed{-6})(x+\boxed{9})=x^2+3x-54$$

$$(5) \quad (3x+1)(\boxed{1}x+\boxed{-2})=3x^2+\boxed{-5}x-2$$

$$(6) \quad (2x+3)(\boxed{2}x+\boxed{-5})=4x^2+\boxed{-4}x-15$$

H5.4

$(x^4 + \underbrace{x^3 + x^2 + x + 1}_{\text{展開したときの } x^4 \text{ の項は}})(3x^2 + 2x + 1)$

$$x^4 \times 1 + x^3 \times 2x + x^2 \times 3x^2 = x^4 + 2x^4 + 3x^4 = 6x^4$$

であり、その係数は $\boxed{6}$ である。