

問 1	(1)	$64 + 18 - 36 = 46$	(2)	$\begin{aligned} & 38 - (24 - 7) \\ & = 38 - 24 + 7 \\ & = 21 \end{aligned}$	(3)	$\begin{aligned} & 0.46 \times 0.59 \\ & = 0.2714 \end{aligned}$
	(4)	$\begin{aligned} & 7.56 \div 0.12 \\ & = 756 \div 12 \\ & = 63 \end{aligned}$	(5)	$\begin{aligned} & \frac{3}{4} + \frac{1}{6} - \frac{2}{3} \\ & = \frac{9}{12} + \frac{2}{12} - \frac{8}{12} = \frac{3}{12} = \frac{1}{4} \end{aligned}$	(6)	$(-9) \times 3 = -27$
	(7)	$\begin{aligned} & (-3) \times (-6) \times (-2) \\ & = -(3 \times 6 \times 2) \\ & = -36 \end{aligned}$	(8)	$\begin{aligned} & 60 \div (-4) \\ & = -(60 \div 4) \\ & = -15 \end{aligned}$	(9)	$\begin{aligned} & -9 \div \frac{3}{5} \\ & = -9 \times \frac{5}{3} = -15 \end{aligned}$
	(10)	$\begin{aligned} & \left(-\frac{15}{7}\right) \div \left(-\frac{3}{14}\right) \\ & = \frac{15^5}{7_1} \times \frac{14^2}{3_1} = 5 \times 2 = 10 \end{aligned}$	(11)	$\begin{aligned} & \frac{4}{15} \times \frac{9}{2} \div \frac{3}{5} = \frac{4^2}{15_1} \times \frac{9^1}{2_1} \times \frac{5^1}{3_1} \\ & = 2 \times 1 \times 1 = 2 \end{aligned}$	(12)	$\begin{aligned} & 5 + 64 \div 8 - 2 \times 3 \\ & = 5 + (64 \div 8) - (2 \times 3) \\ & = 5 + 8 - 6 \\ & = 7 \end{aligned}$
	(13)	$\begin{aligned} & -6 + (-3) \times \{2 - (-4)\} \\ & = -6 + (-3) \times 6 \\ & = -6 - 18 \\ & = -24 \end{aligned}$	(14)	$\begin{aligned} & (-3)^2 \div 9 + 6 \times (-2^3) \\ & = 9 \div 9 + 6 \times (-8) \\ & = 1 - 48 = -47 \end{aligned}$	(15)	$\begin{aligned} & \left(-\frac{9}{10}\right) \div \left(-\frac{3}{7}\right) \div \left(-\frac{7}{5}\right) \\ & = -\left(\frac{9^3}{10_2} \times \frac{7^1}{3_1} \times \frac{5^1}{7_1}\right) = -\frac{3}{2} \end{aligned}$

問 2	(1)	$\begin{aligned} & 5x - 9y - 7x + 4y \\ & = (5x - 7x) + (-9y + 4y) \\ & = -2x - 5y \end{aligned}$	(2)	$\begin{aligned} & (3x - 4y) + (7x - y) \\ & = 3x - 4y + 7x - y \\ & = (3x + 7x) + (-4y - y) \\ & = 10x - 5y \end{aligned}$	(3)	$\begin{aligned} & (x + 6y) - (-2x + 3y) \\ & = x + 6y + 2x - 3y \\ & = (x + 2x) + (6y - 3y) = 3x + 3y \end{aligned}$
	(4)	$\begin{aligned} & x^2 - 5x - x - 3x^2 \\ & = (x^2 - 3x^2) + (-5x - x) \\ & = -2x^2 - 6x \end{aligned}$	(5)	$\begin{aligned} & x + \frac{1}{2}y - 2x + \frac{2}{3}y \\ & = x - 2x + \frac{1}{2}y + \frac{2}{3}y = -x + \frac{7}{6}y \end{aligned}$	(6)	$\begin{aligned} & a^{13} \times a^8 \\ & = a^{13+8} \\ & = a^{21} \end{aligned}$
	(7)	$(x^4)^4 = x^{4 \times 4} = x^{16}$	(8)	$\begin{aligned} & (3x^2y^4)^3 = 3^3x^{2 \times 3}y^{4 \times 3} \\ & = 27x^6y^{12} \end{aligned}$	(9)	$\begin{aligned} & 3x \times (-8xy) = -3 \times 8 \times x \times x \times y \\ & = -24x^2y \end{aligned}$
	(10)	$\begin{aligned} & \frac{4}{5}ab \times \left(-\frac{5}{2}ab\right) \\ & = -\frac{2 \times 4ab \times 5ab}{1 \times 5 \times 2_1} = -2a^2b^2 \end{aligned}$	(11)	$\begin{aligned} & 12x^2y \div 4x^2 \\ & = \frac{3 \times 12 \cancel{x^2}y}{4 \cancel{x^2}} = 3y \end{aligned}$	(12)	$\begin{aligned} & 5x \div \left(-\frac{5}{6}x^2\right) \\ & = 5x \times \left(-\frac{6}{5x^2}\right) = -\frac{6}{x} \end{aligned}$

問 3	(1)	$\begin{aligned} & 4a(a - 5) \\ & = 4a \times a + 4a \times (-5) \\ & = 4a^2 - 20a \end{aligned}$	(2)	$\begin{aligned} & 5x(x + 2y + 3) \\ & = 5x \times x + 5x \times 2y + 5x \times 3 \\ & = 5x^2 + 10xy + 15x \end{aligned}$
	(3)	$\begin{aligned} & (a + 2b)(3a + 5) \\ & = a \times 3a + a \times 5 + 2b \times 3a + 2b \times 5 \\ & = 3a^2 + 6ab + 5a + 10b \end{aligned}$	(4)	$\begin{aligned} & (3x - 2)^2 \\ & = (3x)^2 + 2 \times 3x \times (-2) + (-2)^2 \\ & = 9x^2 - 12x + 4 \end{aligned}$
	(5)	$\begin{aligned} & (x + 12)(x - 12) \\ & = x^2 - 12^2 = x^2 - 144 \end{aligned}$	(6)	$\begin{aligned} & (2x + 3)(x - 3) \\ & = 2x \times x + 2x \times (-3) + 3 \times x + 3 \times (-3) \\ & = 2x^2 - 6x + 3x - 9 = 2x^2 - 3x - 9 \end{aligned}$
	(7)	$\begin{aligned} & (x + 5)(x - 4) \\ & = x^2 + (5 - 4)x + 5 \times (-4) \\ & = x^2 + x - 20 \end{aligned}$	(8)	$\begin{aligned} & (x + 1)(x - 1)(3 - 4x) \\ & = (x^2 - 1)(3 - 4x) \\ & = x^2 \times 3 - x^2 \times 4x - 1 \times 3 - 1 \times (-4x) \\ & = -4x^3 + 3x^2 + 4x - 3 \end{aligned}$

問 4	(1)	$5x^2 - 10x$ $= 5x(x-2)$	(2)	$3abc + 6bc + 15bc^2$ $= 3bc(a+2+5c)$
	(3)	$x^2 + 12x + 36$ $= x^2 + (2 \times 6)x + 6^2$ $= (x+6)^2$	(4)	$2x^2 - 8x + 8$ $= 2(x^2 - 4x + 4)$ $= 2(x^2 - (2 \times 2)x + 2^2)$ $= 2(x-2)^2$
	(5)	$36 - a^2$ $= 6^2 - a^2$ $= (6-a)(6+a)$	(6)	$x^2 + 11x + 18$ $= x^2 + (2+9)x + (2 \times 9)$ $= (x+2)(x+9)$
	(7)	$x^2 + 2x - 24$ $= x^2 + (6-4)x + \{6 \times (-4)\}$ $= (x+6)(x-4)$	(8)	$mn + m - n - 1$ $= m(n+1) - (n+1)$ $= (m-1)(n+1)$

Challenge 問題

(1)	①	$(x-y+1)(x-y-1)$ $= (M+1)(M-1) \quad \leftarrow x-y=M \text{とおく}$ $= M^2 - 1^2$ $= (x-y)^2 - 1$ $= x^2 - 2xy + y^2 - 1$	
	②	$(x-1)^3$ $= (x-1)(x-1)(x-1)$ $= (x^2 - 2x + 1)(x-1)$ $= x^3 - x^2 - 2x^2 + 2x + x - 1$ $= x^3 - 3x^2 + 3x - 1$	
(2)	①	$10x^2 - x - 3$ $= (2 \times 5)x^2 + (2 \times (-3) + 1 \times 5)x + 1 \times (-3)$ $= (2x+1)(5x-3)$	$acx^2 + (ad+bc)x + bd = (ax+b)(cx+d)$
	②	$a + 2b + 3ab + 6b^2$ $= a(1+3b) + 2b(1+3b)$ $= (a+2b)(1+3b)$	
	③	$(x-1)^2 + 3(x-1) - 4$ $= M^2 + 3M - 4 \quad \leftarrow x-1=M \text{とおく}$ $= (M+4)(M-1)$ $= (x-1+4)(x-1-1)$ $= (x+3)(x-2)$	