9. 次の計算をしなさい。

(1) $4 \times (3-1) \times (2-3) = -8$

(2) $1 + 2 - 3 \div 4 = \dfrac{9}{4}$

(3) $\dfrac{3}{2} \div \dfrac{5}{3} = \dfrac{9}{10}$

(4) $\dfrac{1}{3} \times 2 - \left(\dfrac{3}{4} - \dfrac{1}{3}\right) \times 3 = -\dfrac{7}{12}$

(5) $7 - 4^3 = -57$

(6) $7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 = 5040$

(7) $2 \times (x-1) + \dfrac{2}{3}x - \dfrac{-5}{9}x - \dfrac{1}{3} = \dfrac{29x - 21}{9}$

(8) $(3 - 2x) + 2(x-5) + (x-2) \div 2 = \dfrac{1}{2}x - 8$

(9) $\dfrac{1}{4}a - 2(a-5) + (3-2a) \times \dfrac{1}{3} = -\dfrac{29}{12}a + 11$

(10) $(a-1) \times \dfrac{3}{5} + \dfrac{a-1}{2} - 2\dfrac{3-(2-5a)}{5} = -\dfrac{9a+15}{10}$

10. 次の計算をしなさい。

(1) $3 \times 5 \times (7-2) = 75$

(2) $2 \times 3 \div 4 = \dfrac{3}{2}$

(3) $\dfrac{2}{7} \times (3+4) = 2$

(4) $\left(\dfrac{1}{3} - \dfrac{2}{5}\right) \div \left(\dfrac{1}{2} - \dfrac{1}{3}\right) = -\dfrac{2}{5}$

(5) $3^3 + 4^2 - (-3)^3 = 70$

(6) $\dfrac{(3+2)^2 - (4-2)^2}{3+5^2} = \dfrac{3}{4}$

(7) $(2 \div 3 \times x \times 5 \div 4 \times 2x - 1) \times 2 \div 3 = \dfrac{10x^2 - 6}{9}$

(8) $3 \div \dfrac{3}{2} \times 3x - 2x(3 - \dfrac{3}{2}) = 3x$

(9) $(1+2) + 3 \times \{(3a-1) - 3 \times (2+a)\} \times \dfrac{3(a-1) - 1 - a - (2-3a)}{7} = 21 - 15a$

(10) $(2^3a - 3^2 + 4a) \times \dfrac{2}{3} - \dfrac{6a - (2-3a)}{4} = \dfrac{23a - 22}{4}$

レベル 2

1. (1)〜(8) は次の計算をしなさい。(9)〜(10) は値を求めなさい。

   (1) $2a+b+3-3a-(2b-1)=-a-b+4$

   (2) $2a^2-3(a+1)-3a^2-2+4a=-a^2+a-5$

   (3) $3(a-b-c)+2(b-2a-1)=-a-b-3c-2$

   (4) $2\{a-(b-c)\}+3\{(b-2c)-a\}=-a+b-4c$

   (5) $5a^2b\times 3ab^2\times 2a=30a^4b^3$

   (6) $\dfrac{1}{2}ab^2\times 6a\times\left(-\dfrac{2}{3}c^3\right)=-2a^2b^2c^3$

   (7) $\dfrac{3a^2}{2b}\div\dfrac{2a}{5c^3}\div 3a^2=\dfrac{5c^3}{4ab}$

   (8) $\dfrac{a}{2c^2}\div\left(\dfrac{2b}{a^3}\right)^2\times\left(\dfrac{3}{2ab}\right)^2\div\dfrac{5ba}{c^3}=\dfrac{9a^4c}{160b^5}$

   (9) $x=1,y=2$ のときの $\left(-\dfrac{1}{2}x^2y\right)^3\times\dfrac{2}{3x^2y}=-\dfrac{x^4y^2}{12}$ で、$-\dfrac{1}{3}$

   (10) $a=\dfrac{1}{3},b=\dfrac{3}{2}$ のとき $\dfrac{a}{2}b^2\times\dfrac{2a}{3b}\div\dfrac{a^3}{5b}=\dfrac{5b^2}{3a}$ で、$\dfrac{45}{4}$

2. (1)〜(8) は次の計算をしなさい。(9)〜(10) は値を求めなさい。

   (1) $x-(2y+3-2x)+(3-y)=3x-3y$

   (2) $x-x^2-3(x-1)+2(x^2-1)=x^2-2x+1$

   (3) $2(x-y)-3(x-z)+(-1)\times(2-z-y-x)=-y+4z-2$

   (4) $3\{1-(x+y)\}-2\{(y-z)-(z-x)\}=-5x-5y+4z+3$

   (5) $5x^2\times 3xy^2z\times 2(-xy)^2=30x^5y^4z$

   (6) $\dfrac{xy}{3}\times\dfrac{1}{6x}\times\left(-\dfrac{y^2}{3xz^3}\right)=-\dfrac{y^3}{54xz^3}$

   (7) $\dfrac{2}{-xy^3}\div\dfrac{-y^2}{xz}\div -3z^2=-\dfrac{2}{3y^5z}$

   (8) $\dfrac{y}{(-2x^2)^2}\div\left(\dfrac{z}{xy^2}\right)^2\times\left(\dfrac{3x}{2z^2}\right)^3\div\dfrac{1}{xyz}=\dfrac{27x^2y^6}{32z^7}$

   (9) $x=2,y=-3$ のときの $\left(\dfrac{x}{y^2}\right)^2\times\dfrac{-2xy}{3}=-\dfrac{2x^3}{3y^3}$ で、$\dfrac{16}{81}$

   (10) $a=\dfrac{1}{2},b=\dfrac{1}{3}$ のとき $\dfrac{ab}{2}\times\dfrac{1}{3ba^2}\div\dfrac{2a^3}{b}=\dfrac{b}{12a^4}$ で、$\dfrac{4}{9}$

3. (1)〜(8) は次の計算をしなさい。(9)〜(10) は値を求めなさい。

(1) $p+(q+p-1)-2(p+3)=q-7$

(2) $-3p^2+3\times(p-1)+2(1-p-p^2)=-5p^2+p-1$

(3) $3(p+q+r)-2(2p+3r)-3(2q-r)=-p-3q$

(4) $2\{2(p+q)-1\}-\{3-(q-p)\}=3p+5q-5$

(5) $ab\times(-3c^2b)^3\times 2ab^2c=-54a^2b^6c^7$

(6) $6ab\times\dfrac{-a^2}{2b}\times\dfrac{5}{3a}b^3=-5a^2b^3$

(7) $\dfrac{-3}{2z}\div\dfrac{2z}{5(-xy)^3}\div 3y^2=\dfrac{5x^3y}{4z^2}$

(8) $\dfrac{a(3b)^2}{(2c)^2}\times\left(-\dfrac{2b^3}{3a}\right)^2\div\left(\dfrac{5}{abc}\right)^2\div\dfrac{c^3}{3}=\dfrac{3ab^{10}}{25c^3}$

(9) $x=4,y=3$ のときの $\dfrac{4x}{y}\times\left(\dfrac{2}{3x^2y}\right)^2=\dfrac{16}{9x^3y^3}$ で、$\dfrac{1}{972}$

(10) $a=-\dfrac{1}{4},b=\dfrac{1}{2}$ のとき $\left(-\dfrac{a^2}{2}b\right)^2\times\dfrac{2a^2}{3b^2}\div\dfrac{5a^3}{b}=\dfrac{a^3b}{30}$ で、$-\dfrac{1}{3840}$

4. (1)〜(8) は次の計算をしなさい。(9)〜(10) は値を求めなさい。

(1) $a+2b+c+2(a-3b)-3(3+c-b)=3a-b-2c-9$

(2) $-3a^2+2ab-5b^2-6ab-3(a^2+b^2)=-6a^2-4ab-8b^2$

(3) $2(a-b)+3(b-c)-4(c-a-1)-5(a+1)=a+b-7c-1$

(4) $3\{2(a-b)-(b-c)\times 3-2(4+c)\}-(2a-3b-c)=4a-12b+4c-24$

(5) $pq^2\times 3r(2pq)^2\times(-rq^2)=-12p^3q^6r^2$

(6) $\dfrac{1}{pq}\times\left(-\dfrac{6pr}{q^2}\right)\times\dfrac{-pq^2}{3}r^2=\dfrac{2pr^3}{q}$

(7) $\dfrac{3q^2}{-p^3}\div\dfrac{5pqr}{3}\div\dfrac{-3p^2}{(2q)^2}=\dfrac{12q^3}{5p^6r}$

(8) $\left(\dfrac{r^2p}{-2q}\right)^3\div 3\dfrac{(2p)^2}{-q^3}\div\left\{\dfrac{(-3pq)^2}{2r}\right\}^2\div\dfrac{qp}{3r^3}=\dfrac{r^{11}}{648p^4q^5}$

(9) $x=2,y=1$ のときの $(x^2y)^3\div\dfrac{2x^3}{3}y^2=\dfrac{3x^3y}{2}$ で、12

(10) $a=\dfrac{2}{5},b=\dfrac{1}{2}$ のとき $\left(-\dfrac{a}{2}b^2\div\dfrac{2}{3ab}\right)\div\dfrac{4a^3b}{3}=-\dfrac{9b^2}{16a}$ で、$-\dfrac{45}{128}$

5. (1)〜(8) は次の計算をしなさい。(9)〜(10) は値を求めなさい。

(1) $x+2y+z+3-(2x-2y+z-1)+(3x-y-z+1)=2x+3y-z+5$

(2) $x^2-3y^2+2(x^2+2xy-3y^2)=3x^2+4xy-9y^2$

(3) $2(xy+yz-zx)-3(zy-yx-xz)+(xy-xz)=6xy-yz$

(4) $2\{2(x^2+x)-5\}-\{3x-2(2x^2-1)\}=8x^2+x-12$

(5) $(-5xy)^3\times(-3xy^3)\times xz^2y^2=375x^5y^8z^2$

(6) $3\dfrac{xy^2}{3z}\times\dfrac{5y^2z}{x}\times\dfrac{2}{3y}x^3\times(-3x)=-10x^4y^3$

(7) $\dfrac{q(-p)^3}{r}\div\dfrac{2r}{(-5q)^3}\times3\dfrac{(3p)^2}{2q^2}=\dfrac{3375p^5q^2}{4r^2}$

(8) $\dfrac{c}{3a^2}\div\left(-3\dfrac{ab}{2c^3}\right)^3\times\left(\dfrac{-3a}{2b^2}\right)^2\div\left(-\dfrac{5ba}{c^3}\right)=\dfrac{2c^{13}}{45a^4b^8}$

(9) $x=-2,y=-2$ のときの $\dfrac{-y}{2x^2}\times\left(\dfrac{3x}{-2y}\right)^2=-\dfrac{9}{8y}$ で、$\dfrac{9}{16}$

(10) $a=\dfrac{2}{3},b=\dfrac{1}{4}$ のとき $-\dfrac{3b^2a}{2}\times3\dfrac{1}{b^3}\div4a^2=-\dfrac{9}{8ab}$ で、$-\dfrac{27}{4}$

6. (1)〜(8) は次の計算をしなさい。(9)〜(10) は値を求めなさい。

(1) $(p+q+r)-(1-2q-p)+(r-q-1)=2p+2q+2r-2$

(2) $2(p^2-q^2)-3(p^2-2pq-q^2)+5pq=-p^2+11pq+q^2$

(3) $4(x^2-3x+1)-3(2x^2+1)-(1-x)=-2x^2-11x$

(4) $3\{5-(2x-3y)\}+\{2x-(3-y)\}-\{(2-3x)-3(x-4y)\}=2x-2y+10$

(5) $\left(ac^2\times3b^2c\right)\times(-ab)^3=-3a^4b^5c^3$

(6) $\dfrac{c^2}{2a}\times\left(-\dfrac{2a}{3}\right)\times abc^2\times\dfrac{1}{3}c^3=-\dfrac{abc^7}{9}$

(7) $-\dfrac{2a}{3b^2c^3}\div\left(\dfrac{2b^2}{c}\div3\dfrac{1}{a^2}b^2\right)=-\dfrac{1}{ab^2c^2}$

(8) $\left\{\dfrac{(-x)^3}{2yz^2}\right\}^3\div\left(\dfrac{2x}{y^3z}\right)^2\times\left\{\dfrac{3(2x)^2}{2zy^2}\right\}^2\div5xy\div3zx^2=-\dfrac{3x^8}{40y^2z^7}$

(9) $x=3,y=2$ のときの $\dfrac{1}{2xy}\times\left(-\dfrac{2x}{3y}\right)^2=\dfrac{2x}{9y^3}$ で、$\dfrac{1}{12}$

(10) $a=-\dfrac{1}{3},b=-\dfrac{1}{3}$ のとき $\dfrac{1}{2b}a\div\left(\dfrac{2a}{3}b\div\dfrac{a^2}{5b}\right)=\dfrac{3a^2}{20b^3}$ で、$-\dfrac{9}{20}$

7. (1)〜(8) は次の計算をしなさい。(9)〜(10) は値を求めなさい。

(1) $a-(2b-1)+(b-2a-1)-(a-1)=-2a-b+1$

(2) $a^2-3ab+4(b^2-3ab)-2(b^2-5a^2)=11a^2-15ab+2b^2$

(3) $3(a-b-c-1)+2(a+2c)-3(a-b)-(c-a+1)=3a-4$

(4) $2\{2-(2a-3b)+3(c-1)\}+3\{a+(3b-2c)-3(1-a)\}=8a+15b-11$

(5) $(pq^2)^2\times\left\{-3(pq)^2\right\}\times p(r^2q)^2=-3p^5q^8r^4$

(6) $\dfrac{1}{2q}\times\dfrac{2r^2}{3q}\times\dfrac{(2r)^2}{3q}\times\dfrac{2q^2}{3p}=\dfrac{8r^4}{27pq}$

(7) $\left(\dfrac{p}{2q^2}\div\dfrac{q^3}{p^2}\right)\div\dfrac{3r^2}{2q^4}=\dfrac{p^3}{3qr^2}$

(8) $\dfrac{abc}{2}\div\left\{\dfrac{2(-bc)^3}{a^2}\times\left(-\dfrac{5}{ab^2}\right)\right\}^2\div\dfrac{5ba}{c^3}=\dfrac{a^6}{1000b^2c^2}$

(9) $x=-2,y=3$ のときの $\dfrac{3}{2}x^2y\times\dfrac{-y}{(3x)^3}\times\dfrac{2}{3x^2y}=-\dfrac{y}{27x^3}$ で、$\dfrac{1}{72}$

(10) $a=\dfrac{1}{2},b=-\dfrac{1}{3}$ のとき $\dfrac{a^2}{2}b^2\times\dfrac{2}{3ab}\div\left(\dfrac{ba^3}{3}\times\dfrac{1}{2}a\right)^2=\dfrac{12}{a^7b}$ で、-4608

8. (1)〜(8) は次の計算をしなさい。(9)〜(10) は値を求めなさい。

(1) $x+y+2x-3y-3z-1+z-(2x+4)=x-2y-2z-5$

(2) $2x^2-3(xy-3y^2)-4(y^2-x^2)-(5-xy+x^2)=5x^2-2xy+5y^2-5$

(3) $2(p+q+3r)-4(2p-1)+3(q+r-1)-2(r-q)=-6p+7q+7r+1$

(4) $3\{2-p-(r-q)\}+3\{(2-p)-(r-q)\}-3\{2-(p-r)-q\}=-3p+9q-9r+6$

(5) $xy^2\times2y^2z^3\times(-xy^2)=-2x^2y^6z^3$

(6) $\dfrac{xy^2}{2}\times\dfrac{2x}{3zy}\times\left(-\dfrac{3xz^2}{2}\right)=-\dfrac{x^3yz}{2}$

(7) $\dfrac{3z^2}{2xy^2}\div\dfrac{2x}{5y^3z}\div(3z)^2\div(\dfrac{2x^2}{3z})=\dfrac{5yz^2}{8x^4}$

(8) $\dfrac{y}{2(-x)^2}\div\left(-\dfrac{2x}{y^3}\right)^3\div\left\{\left(-\dfrac{3z}{2x}\right)^2\div\dfrac{5x}{(-yz)^3}\right\}^2=-\dfrac{25xy^4}{81z^{10}}$

(9) $x=4,y=5$ のときの $\left(-\dfrac{1}{2}y^2x\right)^3\times\dfrac{4x}{y^2}=-\dfrac{x^4y^4}{2}$ で、-80000

(10) $a=\dfrac{3}{2},b=\dfrac{3}{5}$ のとき $\dfrac{1}{2b}a^2\div\dfrac{4a}{3}b\div\dfrac{3a^2}{5}b=\dfrac{5}{8ab^3}$ で、$\dfrac{625}{324}$

9. (1)〜(8) は次の計算をしなさい。(9)〜(10) は値を求めなさい。

(1) $a-(b+1)-(c-1)+(3a-2b-1)=4a-3b-c-1$

(2) $a^2-3ab+2b^2-(4a^2-3b^2)+3(5-7ab)=-3a^2-24ab+5b^2+15$

(3) $3(a+b)-2(3c-a)+2(a-b-c)+2c-6+3(a-b)=10a-2b-6c-6$

(4) $2\{a-(b-c)\}+\{3a-3(b-2c)\}+2\{2(a-b-c)-3c+b\}-3\{a-2(b-2c)\}=6a-b-14c$

(5) $5pq^2\times(-qr^2p)\times pq^2r^3=-5p^3q^5r^5$

(6) $\dfrac{pq}{2r}\times\dfrac{pr}{3q}\times\dfrac{6}{pqr}\times(-qr)=-p$

(7) $\dfrac{1}{2p}r^3\div\dfrac{2q}{pr^3}\div\dfrac{3p^2}{4}q^2=\dfrac{r^6}{3p^2q^3}$

(8) $3\left\{\dfrac{q}{2p^2}\div\left(\dfrac{(-2pr)^3}{q}\right)^2\times\left(\dfrac{r^2}{-2pq}\right)^2\right\}\div\dfrac{-5p^2q}{r^2}=\dfrac{3}{2560p^{12}}$

(9) $x=3,y=-2$ のときの $\dfrac{3}{2}x^2y\times\left(-\dfrac{2}{3x^2y}\right)^2\times\dfrac{-3xy^2}{2}=-\dfrac{y}{x}$ で、$\dfrac{2}{3}$

(10) $a=-\dfrac{5}{3},b=-\dfrac{3}{5}$ のとき $\dfrac{a}{2}b^2\times\left(-\dfrac{2a^2}{3b}\div\dfrac{-a}{b}\right)^3=\dfrac{4a^4b^2}{27}$ で、$\dfrac{100}{243}$

10. (1)〜(8) は次の計算をしなさい。(9)〜(10) は値を求めなさい。

(1) $(p+q-1)-(q-p+1)-(p+q+1)-(1-p+q)=2p-2q-4$

(2) $p^2+2(pq-q^2)+3(p^2-pq+2q^2)-(pq-p^2-q^2)=5p^2-2pq+5q^2$

(3) $4(p+2q+3r)-2(2q-3r)-3(q-r-1)+2(2p-3-q=8p-q+21r-3$

(4) $\{p-q-(1-r)\}+\{p-2(q-1)-r\}-\{3(p-q)-4(1-r)\}+\{2(p-q-1)-r\})=p-2q-5r+3$

(5) $\left(a^2b\times3bc^2\right)^2\times2a^2=18a^6b^4c^4$

(6) $-\dfrac{1}{2}ab^2\times\dfrac{5b}{a^2}\times\dfrac{2}{(-3ab)^3}=\dfrac{5}{27a^4}$

(7) $\dfrac{ab^2}{2ab}\div\dfrac{2(-ba)^2}{(-5c)^3}\div\dfrac{3c^2}{5ab^2}\div\dfrac{3c^2}{2a}=-\dfrac{625b}{18c}$

(8) $\left\{\dfrac{-z^3}{(3xy)^2}\div\left(\dfrac{2y}{-x^3}\right)^2\right\}\div\left\{\left(\dfrac{3zy^2}{2}\right)^2\div\dfrac{(-2y)^2}{x^2}\right\}^2=-\dfrac{64}{729y^8z}$

(9) $x=3,y=-4$ のときの $\dfrac{3}{2xy}\times\left(-\dfrac{2}{3x^2y}\right)\times\dfrac{2x}{3}=\dfrac{2}{3x^2y^2}$ で、$-\dfrac{1}{216}$

(10) $a=\dfrac{1}{3},b=-\dfrac{1}{2}$ のとき $\dfrac{1}{2a^2}b\div\left(\dfrac{1}{3ab^2}\div\dfrac{2a}{b^3}\right)^2=\dfrac{18a^2}{b}$ で、-4