

等式の変形(1)

例題1 次の式を[]内の文字について解け。

(1) $x+2y=3z$ [x]

答

(2) $3a-x=2b$ [x]

答

(3) $-3n=8-y$ [y]

答

練習1A 次の式を[]内の文字について解け。

(1) $a-5b=3c$ [a]

答

(4) $2m-n=4p$ [n]

答

(7) $-5a=x-b$ [x]

答

(2) $3y+x=-6$ [x]

答

(5) $8a-b=-3$ [b]

答

(8) $-2n=-p+m$ [m]

答

(3) $4x+y=5$ [y]

答

(6) $-5x-y=12$ [y]

答

(9) $3b=a-2c$ [a]

答

等式の変形(1)

例題1 次の式を[]内の文字について解け。

(1) $x+2y=3z$ [x]

★
 $x=-2y+3z$

答 $x=-2y+3z$

(2) $3a-x=2b$ [x]

★
 $-x=-3a+2b$
 $x=3a-2b$

答 $x=3a-2b$

(3) $-3n=8-y$ [y]

★
 $8-y=-3n$
 $-y=-3n-8$
 $y=3n-8$

答 $y=3n-8$

練習1A 次の式を[]内の文字について解け。

(1) $a-5b=3c$ [a]

★
 $a=5b+3c$

答 $a=5b+3c$

(2) $3y+x=-6$ [x]

★
 $x=-3y-6$

答 $x=-3y-6$

(3) $4x+y=5$ [y]

★
 $y=-4x+5$

答 $y=-4x+5$

(4) $2m-n=4p$ [n]

★
 $-n=-2m+4p$
 $n=2m-4p$

答 $n=2m-4p$

(5) $8a-b=-3$ [b]

★
 $-b=-8a-3$
 $b=8a+3$

答 $b=8a+3$

(6) $-5x-y=12$ [y]

★
 $-y=5x+12$
 $y=-5x-12$

答 $y=-5x-12$

(7) $-5a=x-b$ [x]

★
 $x-b=-5a$
 $x=-5a+b$

答 $x=-5a+b$

(8) $-2n=-p+m$ [m]

★
 $-p+m=-2n$
 $m=-2n+p$

答 $m=-2n+p$

(9) $3b=a-2c$ [a]

★
 $a-2c=3b$
 $a=3b+2c$

答 $a=3b+2c$

等式の変形(2)

例題2 次の式を[]内の文字について解け。

(1) $3x=12y$ [x]

答

(2) $4mn=-12p$ [n]

答

(3) $-8b=16a-4$ [y]

答

練習2A 次の式を[]内の文字について解け。

(1) $-4x=20y$ [x]

答

(4) $2ab=-14c$ [b]

答

(7) $4n=3m+8$ [n]

答

(2) $6m=-4n$ [m]

答

(5) $Sh=V$ [S]

答

(8) $-5y=-2x+7$ [y]

答

(3) $12x=9y$ [x]

答

(6) $5mn=20$ [m]

答

(9) $3b=-6a+15$ [b]

答

等式の変形(2)

例題2 次の式を[]内の文字について解け。

(1) $3x=12y$ [x]

$$\begin{aligned} \star & \\ \frac{1 \cancel{3} x}{\cancel{3}_1} &= \frac{4 \cancel{12} y}{\cancel{3}_1} \\ x &= 4y \end{aligned}$$

答 $x=4y$

(2) $4mn=-12p$ [n]

$$\begin{aligned} \star & \\ \frac{1 \cancel{4} \cancel{m} n}{\cancel{4}_1 \cancel{m}_1} &= \frac{3 \cancel{12} p}{\cancel{4}_1 m} \\ n &= -\frac{3p}{m} \end{aligned}$$

答 $n=-\frac{3p}{m}$

(3) $-8b=16a-4$ [y]

$$\begin{aligned} \star & \\ 8b &= -16a+4 \\ \frac{1 \cancel{8} b}{\cancel{8}_1} &= -\frac{2 \cancel{16} a}{\cancel{8}_1} + \frac{1 \cancel{4}}{\cancel{8}_2} \\ b &= -2a + \frac{1}{2} \end{aligned}$$

答 $b=-2a+\frac{1}{2}$

練習2A 次の式を[]内の文字について解け。

(1) $-4x=20y$ [x]

$$\begin{aligned} \star & \\ 4x &= -20y \\ \frac{1 \cancel{4} x}{\cancel{4}_1} &= -\frac{4 \cancel{20} y}{\cancel{4}_1} \\ x &= -5y \end{aligned}$$

答 $x=-5y$

(4) $2ab=-14c$ [b]

$$\begin{aligned} \star & \\ \frac{1 \cancel{2} \cancel{a} b}{\cancel{2}_1 \cancel{a}_1} &= -\frac{7 \cancel{14} c}{\cancel{2}_1 a} \\ b &= -\frac{7c}{a} \end{aligned}$$

答 $b=-\frac{7c}{a}$

(7) $4n=3m+8$ [n]

$$\begin{aligned} \star & \\ \frac{1 \cancel{4} n}{\cancel{4}_1} &= \frac{3m}{4} + \frac{2 \cancel{8}}{\cancel{4}_1} \\ n &= \frac{3}{4}m + 2 \end{aligned}$$

答 $n=\frac{3}{4}m+2$

(2) $6m=-4n$ [m]

$$\begin{aligned} \star & \\ \frac{1 \cancel{6} m}{\cancel{6}_1} &= -\frac{2 \cancel{4} n}{\cancel{6}_3} \\ m &= -\frac{2}{3}n \end{aligned}$$

答 $m=-\frac{2}{3}n$

(5) $Sh=V$ [S]

$$\begin{aligned} \star & \\ \frac{S \cancel{h}^1}{1 \cancel{h}_1} &= \frac{V}{h} \\ S &= \frac{V}{h} \end{aligned}$$

答 $S=\frac{V}{h}$

(8) $-5y=-2x+7$ [y]

$$\begin{aligned} \star & \\ 5x &= 2x-7 \\ \frac{1 \cancel{5} y}{\cancel{5}_1} &= \frac{2x}{5} - \frac{7}{5} \\ y &= \frac{2}{5}x - \frac{7}{5} \end{aligned}$$

答 $y=\frac{2}{5}x-\frac{7}{5}$

(3) $12x=9y$ [x]

$$\begin{aligned} \star & \\ \frac{1 \cancel{12} x}{\cancel{12}_1} &= \frac{3 \cancel{9} y}{\cancel{12}_4} \\ x &= \frac{3}{4}y \end{aligned}$$

答 $x=\frac{3}{4}y$

(6) $5mn=20$ [m]

$$\begin{aligned} \star & \\ \frac{1 \cancel{5} \cancel{m} n}{\cancel{5}_1 \cancel{m}_1} &= \frac{4 \cancel{20}}{\cancel{5}_1 n} \\ m &= \frac{4}{n} \end{aligned}$$

答 $m=\frac{4}{n}$

(9) $3b=-6a+15$ [b]

$$\begin{aligned} \star & \\ \frac{1 \cancel{3} b}{\cancel{3}_1} &= -\frac{2 \cancel{6} a}{\cancel{3}_1} + \frac{5 \cancel{15}}{\cancel{3}_1} \\ b &= -2a+5 \end{aligned}$$

答 $b=-2a+5$

等式の変形(3)

例題3 次の式を[]内の文字について解け。

(1) $3x+4y=12$ [y]

答

(2) $-6a=10b-8$ [b]

答

練習3A 次の式を[]内の文字について解け。

(1) $8a=2b-5$ [a]

答

(4) $2n-6m=10$ [m]

答

(2) $3x+5y=21$ [x]

答

(5) $-4x+6=2y$ [y]

答

(3) $5-4m+8n=0$ [n]

答

(6) $6a+3b=-12$ [b]

答

等式の変形(3)

例題3 次の式を[]内の文字について解け。

(1) $3x+4y=12$ [y]

★

$$4y = -3x + 12$$

$$\frac{1}{4} \cdot 4y = -\frac{3x}{4} + \frac{3}{4} \cdot 12$$

$$y = -\frac{3}{4}x + 3$$

答 $y = -\frac{3}{4}x + 3$

(2) $-6a=10b-8$ [b]

★

$$10b - 8 = -6a$$

$$10b = -6a + 8$$

$$\frac{1}{10} \cdot 10b = -\frac{6a}{10} + \frac{4}{5}$$

$$b = -\frac{3}{5}a + \frac{4}{5}$$

答 $b = -\frac{3}{5}a + \frac{4}{5}$

練習3A 次の式を[]内の文字について解け。

(1) $8a=2b-5$ [a]

★

$$8a = -2b + 5$$

$$\frac{1}{8} \cdot 8a = -\frac{2b}{8} + \frac{5}{8}$$

$$a = -\frac{1}{4}b + \frac{5}{8}$$

答 $a = -\frac{1}{4}b + \frac{5}{8}$

(2) $3x+5y=21$ [x]

★

$$3x = -5y + 21$$

$$\frac{1}{3} \cdot 3x = -\frac{5y}{3} + \frac{7}{1} \cdot \frac{21}{3}$$

$$x = -\frac{5}{3}y + 7$$

答 $x = -\frac{5}{3}y + 7$

(3) $5-4m+8n=0$ [n]

★

$$8n = 4m - 5$$

$$\frac{1}{8} \cdot 8n = \frac{1}{2} \cdot 4m - \frac{5}{8}$$

$$n = \frac{1}{2}m - \frac{5}{8}$$

答 $n = \frac{1}{2}m - \frac{5}{8}$

(4) $2n-6m=10$ [m]

★

$$-6m = -2n + 10$$

$$6m = 2n - 10$$

$$\frac{1}{6} \cdot 6m = \frac{2n}{6} - \frac{5}{3}$$

$$m = \frac{1}{3}n - \frac{5}{3}$$

答 $m = \frac{1}{3}n - \frac{5}{3}$

(5) $-4x+6=2y$ [y]

★

$$2y = -4x + 6$$

$$\frac{1}{2} \cdot 2y = -\frac{4x}{2} + \frac{3}{1} \cdot \frac{6}{2}$$

$$y = -2x + 3$$

答 $y = -2x + 3$

(6) $6a+3b=-12$ [b]

★

$$3b = -6a - 12$$

$$\frac{1}{3} \cdot 3b = -\frac{6a}{3} - \frac{6}{1} \cdot \frac{12}{3}$$

$$b = -2a - 6$$

答 $b = -2a - 6$

等式の変形(4)

例題4 次の式を[]内の文字について解け。

(1) $-3y=4x$ [x]

答

(2) $V=\pi r^2 h$ [h]

答

(3) $5a-8b=6c$ [c]

答

練習4A 次の式を[]内の文字について解け。

(1) $9x=6y$ [y]

答

(4) $S=3ab$ [a]

答

(7) $6m-8=9n$ [n]

答

(2) $5a=-8b$ [b]

答

(5) $V=abc$ [b]

答

(8) $3x+5=4y$ [y]

答

(3) $-18n=-3m$ [m]

答

(6) $-2x=yz$ [y]

答

(9) $-6a+2c=3b$ [b]

答

等式の変形(4)

例題4 次の式を[]内の文字について解け。

(1) $-3y=4x$ [x]

★
 $4x = -3y$
 $\frac{1}{4} \cancel{x} = -\frac{3y}{4}$
 $x = -\frac{3}{4}y$

答 $x = -\frac{3}{4}y$

(2) $V = \pi r^2 h$ [h]

★
 $\pi r^2 h = V$
 $\frac{1}{\pi} \cancel{\pi} \cancel{r^2} h = \frac{V}{\pi r^2}$
 $h = \frac{V}{\pi r^2}$

答 $h = \frac{V}{\pi r^2}$

(3) $5a - 8b = 6c$ [c]

★
 $6c = 5a - 8b$
 $\frac{1}{6} \cancel{6} c = \frac{5a}{6} - \frac{8b}{6}$
 $c = \frac{5}{6}a - \frac{4}{3}b$

答 $c = \frac{5}{6}a - \frac{4}{3}b$

練習4A 次の式を[]内の文字について解け。

(1) $9x = 6y$ [y]

★
 $6y = 9x$
 $\frac{1}{6} \cancel{6} y = \frac{3}{3} \frac{9x}{3}$
 $y = \frac{3}{2}x$

答 $y = \frac{3}{2}x$

(2) $5a = -8b$ [b]

★
 $-8a = 5b$
 $8a = -5b$
 $\frac{1}{8} \cancel{8} a = -\frac{5b}{8}$
 $a = -\frac{5}{8}b$

答 $a = -\frac{5}{8}b$

(3) $-18n = -3m$ [m]

★
 $-3m = -18n$
 $3m = 18n$
 $\frac{1}{3} \cancel{3} m = \frac{6}{3} \frac{18n}{3}$
 $m = 6n$

答 $m = 6n$

(4) $S = 3ab$ [a]

★
 $3ab = S$
 $\frac{1}{3} \cancel{3} a \cancel{b} = \frac{S}{3b}$
 $a = \frac{S}{3b}$

答 $a = \frac{S}{3b}$

(5) $V = abc$ [b]

★
 $abc = V$
 $\frac{1}{a} \cancel{a} \cancel{b} \cancel{c} = \frac{V}{ac}$
 $b = \frac{V}{ac}$

答 $b = \frac{V}{ac}$

(6) $-2x = yz$ [y]

★
 $yz = -2x$
 $\frac{y}{1} \cancel{z} = -\frac{2x}{z}$
 $y = -\frac{2x}{z}$

答 $y = -\frac{2x}{z}$

(7) $6m - 8 = 9n$ [n]

★
 $9n = 6m - 8$
 $\frac{1}{9} \cancel{9} n = \frac{2}{3} \frac{6m}{3} - \frac{8b}{9}$
 $n = \frac{2}{3}m - \frac{8}{9}$

答 $n = \frac{2}{3}m - \frac{8}{9}$

(8) $3x + 5 = 4y$ [y]

★
 $4y = 3x + 5$
 $\frac{1}{4} \cancel{4} y = \frac{3x}{4} + \frac{5}{4}$
 $y = \frac{3}{4}x + \frac{5}{4}$

答 $y = \frac{3}{4}x + \frac{5}{4}$

(9) $-6a + 2c = 3b$ [b]

★
 $3b = -6a + 2c$
 $\frac{1}{3} \cancel{3} b = -\frac{2}{3} \frac{6a}{3} + \frac{2c}{3}$
 $b = -2a + \frac{2}{3}c$

答 $b = -2a + \frac{2}{3}c$

等式の変形(5)

例題5 次の式を[]内の文字について解け。

(1) $2(a+b)=c$ [a]

答

(2) $12=4(x-y)$ [y]

答

練習5A 次の式を[]内の文字について解け。

(1) $5(x+y)=z$ [x]

答

(4) $15=3(a+b)$ [a]

答

(2) $6(a+b)=2c$ [a]

答

(5) $-3(x-y)=4z$ [z]

答

(3) $3(x-y)=z$ [y]

答

(6) $8=12(m-n)$ [n]

答

等式の変形(5)

例題5 次の式を[]内の文字について解け。

(1) $2(a+b)=c$ [a]

★

$$\begin{aligned} 2a+2b &= c \\ 2a &= -2b+c \\ \frac{1}{2}a &= -\frac{1}{2}b + \frac{c}{2} \\ a &= -b + \frac{c}{2} \end{aligned}$$

答 $a = -b + \frac{c}{2}$

(2) $12=4(x-y)$ [y]

★

$$\begin{aligned} 4(x+y) &= 12 \\ 4x-4y &= 12 \\ -4y &= 4y-12 \\ 4y &= -4x+12 \end{aligned} \qquad \begin{aligned} \frac{1}{4}y &= -\frac{1}{4}x + \frac{3}{4} \\ y &= -x+3 \end{aligned}$$

答 $y = -x+3$

練習5A 次の式を[]内の文字について解け。

(1) $5(x+y)=z$ [x]

★

$$\begin{aligned} 5x+5y &= z \\ 5x &= z-5y \\ \frac{1}{5}x &= \frac{z}{5} - \frac{1}{5}y \\ x &= \frac{z}{5} - y \end{aligned}$$

答 $x = \frac{z}{5} - y$

(2) $6(a+b)=2c$ [a]

★

$$\begin{aligned} 6a+6b &= 2c \\ 6a &= 2c-6b \\ \frac{1}{6}a &= \frac{1}{6}c - \frac{1}{6}b \\ a &= \frac{1}{3}c - b \end{aligned}$$

答 $a = \frac{1}{3}c - b$

(3) $3(x-y)=z$ [y]

★

$$\begin{aligned} 3x-3y &= z \\ -3y &= -3x+z \\ 3y &= 3x-z \\ y &= x - \frac{z}{3} \end{aligned} \qquad \begin{aligned} \frac{1}{3}y &= \frac{1}{3}x - \frac{z}{3} \end{aligned}$$

答 $y = x - \frac{z}{3}$

(4) $15=3(a+b)$ [a]

★

$$\begin{aligned} 3(a+b) &= 15 \\ 3a+3b &= 15 \\ 3a &= -3b+15 \\ \frac{1}{3}a &= -\frac{1}{3}b + \frac{5}{3} \\ a &= -b+5 \end{aligned}$$

答 $a = -b+5$

(5) $-3(x-y)=4z$ [z]

★

$$\begin{aligned} 4z &= -3(x-y) \\ 4z &= -3x+3y \\ \frac{1}{4}z &= \frac{-3x}{4} + \frac{3y}{4} \\ z &= -\frac{3}{4}x + \frac{3}{4}y \end{aligned}$$

答 $z = -\frac{3}{4}x + \frac{3}{4}y$

(6) $8=12(m-n)$ [n]

★

$$\begin{aligned} 12(m-n) &= 8 \\ 12m-12n &= 8 \\ -12n &= -12m+8 \\ 12n &= 12m-8 \end{aligned} \qquad \begin{aligned} \frac{1}{12}n &= \frac{1}{12}m - \frac{2}{12} \\ n &= m - \frac{2}{3} \end{aligned}$$

答 $n = m - \frac{2}{3}$

等式の変形(6)

例題6 次の式を[]内の文字について解け。

(1) $S = \frac{1}{2}ah$ [a]

答

(2) $S = \frac{1}{2}(a+b)$ [a]

答

練習6A 次の式を[]内の文字について解け。

(1) $\frac{1}{3}xy = -4$ [y]

答

(2) $m = -\frac{1}{2}ab$ [a]

答

(3) $\frac{1}{3}mn = -6$ [m]

答

(4) $\frac{ab}{4} = -2$ [b]

答

(5) $y = \frac{1}{6}(x+z)$ [x]

答

(6) $a = \frac{3}{5}(b-1)$ [b]

答

等式の変形(6)

例題6 次の式を[]内の文字について解け。

$$(1) S = \frac{1}{2}ah \quad [a]$$

★

$$\frac{1}{2}ah = S \quad ah = 2S$$

$$\frac{a \cancel{h}^1}{\cancel{1}h} = \frac{2S}{h}$$

$$a = \frac{2S}{h}$$

答 $a = \frac{2S}{h}$

$$(2) S = \frac{1}{2}(a+b) \quad [a]$$

★

$$\frac{1}{2}(a+b) = S$$

$$a+b = 2S$$

$$a = -b + 2S$$

答 $a = -b + 2S$

練習6A 次の式を[]内の文字について解け。

$$(1) \frac{1}{3}xy = -4 \quad [y]$$

★

$$xy = -12$$

$$\frac{\cancel{1}xy}{\cancel{1}x} = \frac{-12}{x}$$

$$y = -\frac{12}{x}$$

答 $y = -\frac{12}{x}$

$$(2) m = -\frac{1}{2}ab \quad [a]$$

★

$$-\frac{1}{2}ab = m \quad ab = -2m$$

$$\frac{a \cancel{b}^1}{\cancel{1}b} = \frac{-2m}{b}$$

$$a = -\frac{2m}{b}$$

答 $a = -\frac{2m}{b}$

$$(3) \frac{1}{3}mn = -6 \quad [m]$$

★

$$mn = -18$$

$$\frac{m \cancel{n}^1}{\cancel{1}n} = \frac{-18}{n}$$

$$m = -\frac{18}{n}$$

答 $m = -\frac{18}{n}$

$$(4) \frac{ab}{4} = -2 \quad [b]$$

★

$$ab = -8$$

$$\frac{\cancel{1}ab}{\cancel{1}a} = \frac{-8}{a}$$

$$b = -\frac{8}{a}$$

答 $b = -\frac{8}{a}$

$$(5) y = \frac{1}{6}(x+z) \quad [x]$$

★

$$\frac{1}{6}(x+z) = y$$

$$x+z = 6y$$

$$x = 6y - z$$

答 $x = 6y - z$

$$(6) a = \frac{3}{5}(b-1) \quad [b]$$

★

$$\frac{3}{5}(b-1) = a$$

$$3(b-1) = 5a$$

$$3b - 3 = 5a$$

$$3b = 5a + 3$$

$$\frac{\cancel{3}b}{\cancel{3}_1} = \frac{5a}{3} + \frac{\cancel{3}}{\cancel{3}_1}$$

$$b = \frac{5}{3}a + 1$$

答 $b = \frac{5}{3}a + 1$