

はやとん

11/9(木) 19:00 ~ 20:00

方程式の解き方

方程式、もんだいの作り方から
解き方と考えてみよう。

$$x = 5$$

$$x + 2 = 5 + 2$$

$$x + 2 = 7$$

$$\frac{x}{2} + 1 = \frac{7}{2}$$

などなど

$$a+b=c$$

$$a-b=c$$

$$2a+2b=2c \quad \text{たじろ}$$

$$2a-2b=2c$$

$$ma+mb=mc \quad \text{たじろ}$$

全ての項を m でわけ

$$a+b=c$$

$$2x = a$$

ならば”
両辺を
2でわって

① どうやる?

② 2で
わって

$$x = \frac{a}{2}$$

$$\frac{x}{2} = b$$

ならば”
② 両辺に
2をかけて

① どうやってしたの? と

② 2倍した

$$x = 2b$$

たずね
た

$$x = 5$$

両方(両辺)に

2を足すと

$$x + 2 = 7$$
$$-2 = -2$$

$$x = 5$$

両辺から

2を引くと

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

$$x = 5$$

両辺を

2倍すると

$$2x = 10$$

$\div 2$

$$x = 5$$

$$x = 8$$

両辺を

2で割ると

$$\frac{x}{2} = 4$$

$\times 2$

$$x = 8$$

両辺に

x をたす

$$2x = x + 8$$

$$x = 8$$

両辺に

$2x$ をたす

$$3x = 2x + 8$$

$$x = 8$$

両辺に

$2x$ をたす

3 を引く

$$3x - 3 = 2x + 5$$

$$2x = 16$$

$$2x - 3 = 13$$

$$x = 8$$

両辺に

2 倍して

3 を引く

$$\frac{(2x-1) \times 3 \times 4}{3} - \frac{(2x-3) \times 4 \times 3}{4} = \frac{15}{3 \times 4} = \frac{5}{4} \times 4 \times 3$$

$$4(2x-1) - 3(2x-3) = 15$$

$$8x - 4 - 6x + 9 = 15$$

$$2x + 5 = 15$$

$$2x = 10$$

$$x = 5$$

$$x=5$$

$$3(2x-1) - 2(2x-3) = \cancel{7} \textcircled{13}$$

$$\begin{array}{r} 9 \\ 27 \end{array}$$

$$\begin{array}{r} - 7 \\ 14 \end{array}$$

$$= 2$$

$$= 13$$

$$\frac{\textcircled{3}(2x-1)}{2x \textcircled{3}} - \frac{\textcircled{2}(2x-3)}{2x3} = \frac{13}{2x3}$$



$$\frac{(2x-1)}{2} \textcircled{2x3}$$

$$- \frac{(2x-3)}{3} \textcircled{2x3}$$

$$= \frac{\textcircled{13}}{\textcircled{6}}$$

$$\cancel{2x3}$$

例 1.2.1

$$10 - (x - 2)$$

$$= 10 - x + 2$$

$$10 - 2(x - 2)$$

$$= 10 - 2x + 4$$

$$10 - 3(x - 2)$$

$$= 10 - 3x + 6$$

$$\frac{2x-1}{2} - \frac{2x-3}{3} = \frac{13}{6}$$

$$3(2x-1) - 2(2x-3) = 13$$

$$6x-3 - 4x+6 = 13$$

$$\frac{(2x-1) \times 2 \times 3}{2} - \frac{(2x-3) \times 3 \times 2}{3} = \frac{13 \times (2 \times 3)}{6}$$

$$3(2x-1) - 2(2x-3) = 13$$

$$(6x-3) - 4x + 6 = 13$$

$$2x + 3 = 13$$

$$2x = 10$$

$$x = 5$$

$$x = 5$$

9

$$\frac{3(3x-2) - 2(2x-1)}{39 - 18} = \frac{21}{6}$$

$$\frac{21x}{6} = \frac{7}{2}$$

$$\frac{3x-2}{2} - \frac{2x-1}{3} = \frac{7}{2}$$

$$\frac{3x-2}{2} - \frac{2x-1}{3} = \frac{7}{2} \quad | \quad 2/$$

$$5x - 4 = 21$$

$$\begin{array}{r} +) \quad 4 = 4 (+ \\ \hline 5x = 25 \end{array}$$

$$x = 5$$

$$\frac{7}{2} \quad 2x \quad 25 \downarrow$$

$\div 2 \quad x \quad \div 2 \quad 12.5$

方法論

$$\begin{array}{l} 2x = 10 \\ x = 5 \end{array}$$

$$\begin{array}{l} 3x = 21 \\ x = 7 \end{array}$$

$$\frac{3x-2}{2} - \frac{2x-1}{3} = \frac{7}{2}$$

$$3(3x-2) - 2(2x-1) = 21$$

$$9x-6 - 4x+2 = 21$$

$$5x-4 = 21$$

$$5x = 25$$

$$x = 5$$

$$x=12$$

$$\frac{x}{4} - \frac{x}{6} = 1$$

$$x=12$$

$$3x - 2x = 12$$

$$\frac{3x}{12} - \frac{2x}{12} = 1$$

$$\frac{x}{4} - \frac{x}{6} = 1$$

$$6x - 4x = 24$$

$$2x = 24$$

$$x = 12$$

$$\frac{x^{x12}}{4} - \frac{x^{x12}}{6} = 1^{x12}$$

$$3x - 2x = 12$$

$$x = 12$$

$$4 \times 6 = 12$$

$$\textcircled{x} = 12$$

$$3x - 2x = 12$$

$$\frac{12}{2}x - \frac{1}{3}x = 2$$

$$\frac{x}{2} - \frac{x}{3} = 2$$

$$x = 12.$$

$$3x - 2x = 12$$

$$\frac{x}{4} - \frac{x}{6} = 1$$

$$\frac{x-1}{4} - \frac{x-1}{6} = \textcircled{1}$$

$$x = 13$$

$$\frac{x-1}{4} - \frac{x-1}{6} = 1$$

$$3(x-1)$$

$$\frac{2(x-1)}{4}$$

$$\frac{x-1}{3}$$

$$\frac{x}{4} \times 3 = \frac{3x}{4}$$

$$\frac{x-1}{4} \times 4 \quad x-1$$

$$\frac{x}{4} \times 4 \rightarrow x$$

$$\frac{x}{2} \times 2 = x$$

$$\frac{x}{3} \times 3 = x$$

$$\frac{x-1}{4}$$

$\div 4 \times 4$

$$\frac{x-1}{6}$$

$$\frac{x}{2} - \frac{x}{3} = 1$$

$$\frac{x}{2} = 1$$

$x = 2$

$$\frac{x-1}{2}$$

$\times 2$

$$x-1$$

$$\frac{x-1}{4} \times 4 \rightarrow x-1$$

$$\left(\frac{x-1}{4}\right)$$

$\times 4$

$$3(x-1)$$

$$\frac{x}{4} \times 4 \quad x$$

$$\frac{x-1}{4} \times 4 \quad x-1$$

$$\begin{array}{l}
 \left(\frac{x-1}{4}\right) \times 4 \times 3 \\
 \downarrow \times 4 \\
 x-1 \\
 \downarrow \times 3 \\
 3(x-1)
 \end{array}$$

$\times 12$

$$\begin{array}{l}
 - \left(\frac{x-1}{3}\right) \\
 \downarrow \times 12 \\
 - 4(x-1)
 \end{array}$$

$$\frac{x-1}{4} - \frac{x-1}{3} = 1$$

各項

3-4

$$3(x-1) - 4(x-1) = 12$$

$$-4x + 4 = 12$$

$$-4x = 8$$

$$-x + 1 = 12$$

$$-x = 11$$

$$x = -11$$

$$\frac{-3}{+4} = 1$$

$$-1 + 7$$

$$+ 8$$

$$13 \times 2 =$$

13 $\times 2$ <hr/> 6 20 <hr/> 26	$10+3$ $\times) 2$ <hr/> $20+6$ $=26$	$(x+3)$ $\times 2$ <hr/> $2x+6$ $2(x+3)$ <hr/> $2x+6$
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$$2(x-1)$$
$$2x-2$$

$$\begin{array}{r} 10+3 \\ \times) \quad 2 \\ \hline 20+6 \end{array}$$

$$\begin{array}{r} x+3 \\ \times) \quad 2 \\ \hline 2x+6 \end{array}$$

$$\begin{array}{l} 2(x+3) \\ = 2x+6 \end{array}$$

$$\begin{array}{r} 10-1 \\ \times) \quad 2 \\ \hline 20-2 \end{array}$$

$$\begin{array}{r} x-1 \\ \times) \quad 2 \\ \hline 2x-2 \end{array}$$

$$\begin{array}{l} 2(x-1) \\ = 2x-2 \end{array}$$

$$= 18.$$

(1) 以下のもんだい (1) ~ (6) は 受験研究社のハイクラステスト
レベルBです。

$$\frac{x-5}{3} + \frac{x-8}{4} = \frac{x-28}{12}$$

(17)

$$\frac{x-5}{(3)} \overset{\times 3 \times 4}{+} \frac{x-8}{(4)} \overset{\times 4 \times 3}{=} \frac{x-28}{(12)} \overset{\times 4 \times 3}{}$$

$$4(x-5) + 3(x-8) = x-28$$

$$4x-5 + 3x-24 = x-28$$

$$(4x-5 + 3x-24)$$

$$7x-29 = x-28$$

$$6x = 1$$

$$x = \frac{1}{6}$$

エ千ガイを採せ

$$(2) \quad \frac{x-2}{2} + (x-4) = \frac{x+2}{4}$$

(2)

$$\frac{x-2}{2} + (x-4) = \frac{x+2}{4}$$

(2×4)をかけてもよいが

こゝは(4) = 2×2 にしておこう

$$\begin{aligned} 2(x-2) + 4(x-4) &= x+2 \\ 2x-4 + 4x-16 &= x+2 \\ 5x &= 22 \end{aligned}$$

$$x = \frac{22}{5}$$

$$(3) \quad \frac{x+10}{6} + \frac{x-5}{3} = \frac{x+10}{2}$$

(3)

$$\frac{(x+10)}{(6)} + \frac{(x-5)}{(3)} = \frac{(x+10)}{(2)}$$

どちらも0倍で、分母が"消えるので"
 $\times 6 = \times 2 \times 3$

$$(x+10) + 2(x-5) = 3(x+10)$$
$$x+10 + 2x-10 = 3x+30$$

xが消えて(またなので)

解は不能

オカシ

友人の書いた式がイ

$$\frac{x+10}{6} + \frac{x-5}{3} = -\frac{x+10}{2}$$

$$(x+10) + 2(x-5) = -3(x+10)$$

$$(x)+10 + (2x)-10 = (-3x)-30$$

$$(6x) = -30$$

$$x = -5$$

分母、分子、注意

(4)

$$\frac{x+1}{2} - \frac{x-2}{7} = -\frac{2}{7}$$

(4)

$$\frac{(x+1) \times 2 \times 7}{2} - \frac{(x-2) \times 7 \times 2}{7} = -\frac{(2) \times 7 \times 2}{7}$$

$$7(x+1) - 2(x-2) = -4$$
$$7x + 7 - 2x + 4 = -4$$

$$5x$$

$$= -15$$

$$x = -3$$

(5)

$$\frac{x+10}{4} + \frac{x-5}{3} = \frac{x-5}{6}$$

(5)

$$\frac{(x+10)^{\times 4 \times 3}}{4} + \frac{(x-5)^{\times 3 \times 4}}{3} = \frac{(x-5)^{\times 6 \times 2}}{6}$$

4と3と6の最小公倍数は

6は3の倍数ゆえ、

4と6の最小公倍数は2をかける。

$$3(x+10) + 4(x-5) = 2(x-5)$$

$$3x + 30 + 4x - 20 = 2x - 10$$

$$7x + 10 = 2x - 10$$

$$5x = -20$$

$$x = -4$$

6)

$$\frac{x+8}{3} - \frac{x+3}{5} = -\frac{x-2}{4}$$

m

(6)

$$\frac{(x+8) \times 3 \times 5 \times 4}{3} - \frac{(x+3) \times 5 \times 3 \times 4}{5} = -\frac{(x-2) \times 4 \times 3 \times 5}{4}$$

これは大変 $\times 3 \times 5 \times 4$ や

$$20(x+8) - 12(x+3) = -15(x-2)$$

$$20x + 160 - 12x - 36 = -15x + 30$$

$$23x$$

$$= 226$$

$$x = -\frac{94}{23}$$

$$\begin{array}{r} +30 \\ +36 \\ -160 \\ \hline -94 \end{array}$$