

方程式 解答目次 1へ 解答へ§ 2 等式の性質 と 方程式

例① $x - 5 = -1$

$x - 5 + 5 = -1 + 5$

$x = 4$

例② $x + 13 = 8$

$x + 13 - 13 = 8 - 13$

$x = -5$

例③ $\frac{x}{4} = -3$

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

$x = -12$

例④ $-7x = 14$

$\frac{-7x}{-7} = \frac{14}{-7}$

$x = -2$

次の方程式を解きなさい の 解答

(1) $x - 9 = 3$

$x - 9 + 9 = 3 + 9$

$x = 12$

(2) $x - 8 = -10$

$x - 8 + 8 = -10 + 8$

$x = -2$

(3) $x + 7 = 15$

$x + 7 - 7 = 15 - 7$

$x = 8$

(4) $x + 6 = 2$

$x + 6 - 6 = 2 - 6$

$x = -4$

(5) $\frac{x}{7} = 3$

$\frac{x}{7} \times 7 = 3 \times 7$

$x = 21$

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

$-\frac{1}{6}x \times 6 = 2 \times 6$

$-x = 12$

$x = -12$

(7) $5x = 45$

$\frac{5x}{5} = \frac{45}{5}$

$x = 9$

(8) $-8x = 48$

$\frac{-8x}{-8} = \frac{48}{-8}$

$x = -6$

次の方程式を解きなさい の 答

(1) $x = 21$

(2) $x = -4$

(3) $x = -4$

(4) $x = -3$

(5) $x = 23$

(6) $x = 15$

(7) $x = -3.5$

(8) $x = -6$

§ 3 方程式の解き方 の 解答

例 1 $4x = 9 + 15$
 $4x = 24$
 $x = \frac{24}{4} = 6$

例 2 $8x - 5x = 21$
 $3x = 21$
 $x = \frac{21}{3} = 7$

1. (1) $5x = 23 - 8$
 $5x = 15$
 $x = \frac{15}{5} = 3$

(2) $6x = -17 + 5$
 $6x = -12$
 $x = \frac{-12}{6} = -2$

(3) $4x + 6x = 50$
 $10x = 50$
 $x = \frac{50}{10} = 5$

(4) $3x - 5x = -14$
 $-2x = -14$
 $x = \frac{-14}{-2} = 7$

例題 1 $7x - 3x = 6 + 2$
 $4x = 8$
 $x = 2$

2. (1) $9x - 4x = 17 - 2$
 $5x = 15$
 $x = 3$

(2) $2x + x = -9 + 18$
 $3x = 9$
 $x = 3$

(3) $7x - 3x = -5 - 15$
 $4x = -20$
 $x = -5$

(4) $-4x - 5x = 8 - 17$
 $-9x = -9$
 $x = 1$

(5) $-x - 5x = -2 - 1$
 $-6x = -3$
 $x = \frac{-3}{-6} = \frac{1}{2}$

(6) $12x - 7x = -3 + 3$
 $5x = 0$
 $x = 0$

例題 2 $7x - 35 = 9x + 1$
 $7x - 9x = 1 + 35$
 $-2x = 36$
 $x = -18$

3. (1) $4x + 1 = 3x + 6$
 $4x - 3x = 6 - 1$
 $x = 5$

(2) $2x - 8 = 9x + 20$
 $2x - 9x = 20 + 8$
 $-7x = 28$
 $x = -4$

(3) $-12 - 4x = 30 - 5x$
 $-4x + 5x = 30 + 12$
 $x = 42$

(4) $5 - 14x + 4 = 1$
 $-14x = 1 - 5 - 4$
 $-14x = -8$
 $x = \frac{-8}{-14} = \frac{4}{7}$

(5) $2x = 1 + \frac{1}{3}$
 $2x = \frac{5}{3}$
 $x = \frac{5}{6}$

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

例題 3 $10\left(\frac{x+1}{2}\right) = 10\left(\frac{1}{5}x + 2\right)$
 $5(x+1) = 2x + 20$
 $5x + 5 = 2x + 20$
 $5x - 2x = 20 - 5$
 $3x = 15$
 $x = 5$

4. (1) $6\left(\frac{x-5}{6}\right) = 6\left(\frac{x-4}{3}\right)$
 $x - 5 = 2(x - 4)$
 $x - 5 = 2x - 8$
 $x - 2x = -8 + 5$
 $-x = -3$
 $x = 3$

(2) $12\left(\frac{2}{3}x + 2\right) = 12\left(\frac{x-7}{4}\right)$
 $8x + 24 = 3(x - 7)$
 $8x + 24 = 3x - 21$
 $8x - 3x = -21 - 24$
 $5x = -45$
 $x = -9$

練習

$$\begin{aligned}(1) \quad 4x &= 40 \\ x &= 10\end{aligned}$$

$$\begin{aligned}(2) \quad -2x &= 6 \\ x &= -3\end{aligned}$$

$$\begin{aligned}(5) \quad x + 3x &= -7 + 17 \\ 4x &= -10 \\ x &= -\frac{5}{2}\end{aligned}$$

$$\begin{aligned}(7) \quad 2x + 2 &= x + 3 \\ 2x - x &= 3 - 2 \\ x &= 1\end{aligned}$$

$$\begin{aligned}(9) \quad 4\left(\frac{1}{4}x - 1\right) &= 4 \times \frac{1}{2}x \\ x - 4 &= 2x \\ x - 2x &= 4 \\ -x &= 4 \\ x &= -4\end{aligned}$$

$$(2) \quad x = -9$$

$$\begin{aligned}(4) \quad 4x - 3x &= -15 + 9 \\ x &= -6\end{aligned}$$

$$\begin{aligned}(6) \quad 3a - 9a &= 1200 + 1200 \\ -6a &= 2400 \\ a &= -400\end{aligned}$$

$$\begin{aligned}(8) \quad 3x - 24 &= 36 - 9x \\ 3x + 9x &= 36 + 24 \\ 12x &= 60 \\ x &= 5\end{aligned}$$

$$\begin{aligned}(10) \quad x &= 4(x - 2) - 2 \\ x &= 4x - 8 - 2 \\ x - 4x &= -8 - 2 \\ -3x &= -10 \\ x &= \frac{10}{3}\end{aligned}$$

§ 4 方程式の利用

1. パン1個の値段を x 円とすると

$$1000 - (3x + 120) = 400$$

$$1000 - 3x - 120 = 400$$

$$-3x = 400 - 1000 + 120$$

$$-3x = -480$$

$$x = 160$$

答 160円

2. 買ったバラの本数を x 本とすると

$$2000 - (210x + 600) = 140$$

$$2000 - 210x - 600 = 140$$

$$-210x = 140 - 2000 + 600$$

$$-210x = -1260$$

$$x = 6$$

答 6本

例題1 本代を x 円とすると

$$780 - x = 2(630 - x)$$

$$780 - x = 1260 - 2x$$

$$-x + 2x = 1260 - 780$$

$$x = 480$$

答 480円

3. 画用紙1枚の値段を x 円とすると

$$8x + 150 = 3(2x + 60)$$

$$8x + 150 = 6x + 180$$

$$8x - 6x = 180 - 150$$

$$2x = 30$$

$$x = 15$$

答 15円

例題2 生徒の人数を x 人とすると

$$5x + 12 = 7x - 4$$

$$5x - 7x = -4 - 12$$

$$-2x = -16$$

$$x = 8$$

答 8人

4. 生徒の人数を x 人とすると

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

$$3x - 4x = -3 - 12$$

$$-x = -15$$

$$x = 15$$

答 15人

はじめにあったカードの枚数は

$$5 \times 8 + 12 = 52$$

答 52枚

例題3 兄が出発してから x 分後に弟に追いつくとする

$$240x = 80(10 + x)$$

$$3x = 10 + x$$

$$3x - x = 10$$

$$2x = 10$$

$$x = 5$$

答 5分後

兄が弟に追いついたのは家から $240 \times 5 = 1200$

答 1200 m

弟が家を出てから20分たって、兄が追いかけたとする

$$240x = 80(20 + x)$$

$$3x = 20 + x$$

$$x = 10$$

10分間で進む距離は $240 \times 10 = 2400\text{m} = 2.4\text{km}$

駅までの距離は 2km

したがって、駅に着くまでには追いつけない。

練習 1 $5x - 3 = 2x + 3$
 $3x = 6$
 $x = 3$

答 $x = 3$

練習 2 はがき1枚の値段を x 円とすると
 $15x + 100 = 20x - 200$
 $-5x = -300$
 $x = 60$

答 60円

問題 1. (1) $x = \frac{2}{3}$

(3) $x = 3$

(5) $x = -3$

(7) $-2x = 16$
 $x = -8$

2. (1) $5x - 40 = x$
 $x = 10$

(3) $9x + 6 = -12 + 6x$
 $3x = -18$
 $x = -6$

(5) $10\left(\frac{2}{5}x - 3\right) = 10\left(\frac{3}{10}x + \frac{1}{2}\right)$
 $4x - 30 = 3x + 5$
 $x = 35$

(2) $x = -\frac{1}{49}$

(4) $x = 2$

(6) $x = -5$

(8) $-6x = -600$
 $x = 100$

(2) $x - 6x - 2 = 18$
 $-5x = 20$
 $x = -4$

(4) $2x - 40 = x + 40$
 $x = 80$

(6) $12\left(\frac{y-1}{4}\right) = 12\left(\frac{y-3}{3}\right)$
 $3(y-1) = 4(y-3)$
 $3y-3 = 4y-12$
 $-y = -9$
 $y = 9$

3. 人数を x 人とすると
 $500x - 1000 = 45x + 600$
 $50x = 1600$
 $x = 32$
 答 32人

4. ふもとから山頂までの距離を x m とすると
 $\frac{x}{50} - \frac{x}{90} = 40$
 $450\left(\frac{x}{50} - \frac{x}{90}\right) = 40 \times 450$
 $9x - 5x = 40 \times 450$
 $4x = 40 \times 450$
 $x = 4500$

答 4500 m

5. $-9 = 3x - 5x - 5$
 $-3x + 5x = -5 + 9$
 $2x = 4$
 $x = 2$

$3x - 5x - 5 = -9$
 $-2x = -4$
 $x = 2$

以上