

二、解下列各方程式

1. $3x=11$

$$x = \frac{11}{3}$$

2. $-2x=16$

$$x = \frac{16}{-2} = -8$$

3. $11=-5y$

$$5y = -11$$

$$y = -\frac{11}{5}$$

4. $\frac{2}{3}x = -12$

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

$$= -12 \times \frac{3}{2}$$

$$= -18$$

5. $-6+y=7$

$$y = 7+6$$

$$= 13$$

6. $9=-x+6$

$$x = 6-9$$

$$= -3$$

7. $2x+8=9$

$$2x = 1$$

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

8. $-5y-4=6$

$$-5y = 10$$

$$y = \frac{10}{-5} = -2$$

9. $3x-20=30$

$$3x = 50$$

$$x = \frac{50}{3}$$

10. $-4x = -7x$

$$-4x + 7x = 0$$

$$3x = 0$$

$$x = 0$$

11. $4x+80=8x+20$

$$-4x = -60$$

$$x = 15$$

12. $6x+5=2x-25$

$$4x = -30$$

$$x = -\frac{30}{4} = -\frac{15}{2}$$

13. $-3x+7=6x-4$

$$-9x = -11$$

$$x = \frac{11}{9}$$

14. $26+3x=50-9x$

$$12x = 24$$

$$x = 2$$

15. $-5x+1 = -x-5$

$$-4x = -6$$

$$x = \frac{-6}{-4} = \frac{3}{2}$$

16. $5x-3-2x+4 = -3x-7-2x$

$$3x+1 = -5x-7$$

$$8x = -8$$

$$x = -1$$

17. $-1+2x-3+4x = -5x+6-7x+8$

$$6x-4 = -12x+14$$

$$18x = 18$$

$$x = 1$$

18. $13 = 2(-3x+4)$

$$13 = -6x+8$$

$$6x = -5$$

$$x = -\frac{5}{6}$$

19. $-3(2x-4) = 30$

$$-6x+12 = 30$$

$$-6x = 18$$

$$x = -3$$

20. $5(2x+3) = 4x+69$

$$10x+15 = 4x+69$$

$$6x = 54$$

$$x = 9$$

21. $3x-2(2x+5) = 60$

$$3x-4x-10 = 60$$

$$-x-10 = 60$$

$$-x = 70$$

$$x = -70$$

22. $2(3-x) = -4(x+5)$

$$6-2x = -4x-20$$

$$2x = -26$$

$$x = -13$$

$$23. 3(x-40) = 100 - x + 40$$

$$3x - 120 = 140 - x$$

$$4x = 260$$

$$x = 65$$

$$24. 2(x-4) - (3x+4) = -20 + 7x$$

$$2x - 8 - 3x - 4 = -20 + 7x$$

$$-x - 12 = -20 + 7x$$

$$-8x = -8$$

$$x = 1$$

$$25. (8x+3) - (5x+2) - x = -7$$

$$8x + 3 - 5x - 2 - x = -7$$

$$2x + 1 = -7$$

$$2x = -8$$

$$x = -4$$

$$26. 3y - 3\left(\frac{2}{3}y - 1\right) = 0$$

$$3y - 2y + 3 = 0$$

$$y + 3 = 0$$

$$y = -3$$

$$27. \frac{1}{4}x - 4 = 3$$

$$\frac{1}{4}x = 7$$

$$x = 7 \div \frac{1}{4}$$

$$= 7 \times \frac{4}{1} = 28$$

$$28. \frac{1}{2}x + \frac{1}{3}x = 6 \quad [2, 3] = 6$$

$$6x\left(\frac{1}{2}x + \frac{1}{3}x\right) = 6 \times 6$$

$$3x + 2x = 36$$

$$5x = 36$$

$$x = \frac{36}{5}$$

$$29. \frac{x}{6} - \frac{x}{9} = -2 \quad [6, 9] = 18$$

$$18 \times \left(\frac{x}{6} - \frac{x}{9}\right) = -2 \times 18$$

$$3x - 2x = -36$$

$$x = -36$$

$$30. \frac{x}{8} = \frac{x}{12} + 4 \quad [8, 12] = 24$$

$$\frac{x}{8} \times 24 = \left(\frac{x}{12} + 4\right) \times 24$$

$$3x = 2x + 96$$

$$x = 96$$

$$31. 4x + 16 = \frac{20}{3}x$$

$$\text{同} \times 3$$

$$12x + 48 = 20x$$

$$-8x = -48$$

$$x = 6$$

$$32. \frac{2}{3}x - 6 = 4x + 16$$

$$\text{同} \times 3$$

$$2x - 18 = 12x + 48$$

$$-10x = 66$$

$$x = \frac{66}{-10} = -\frac{33}{5}$$

$$33. \frac{2}{3}x - \frac{3}{2} = \frac{1}{4}x - \frac{3}{4} \quad [3, 2, 4] = 24$$

$$\text{同} \times 24$$

$$16x - 36 = 6x - 18$$

$$10x = 18$$

$$x = \frac{18}{10} = \frac{9}{5}$$

$$34. \frac{x}{5} - \frac{x}{8} = \frac{x}{10} - 12 \quad [5, 8, 10] = 40$$

$$\text{同} \times 40$$

$$8x - 5x = 4x - 480$$

$$-x = -480$$

$$x = 480$$

$$35. \frac{3}{2}x - 2 = 2x + \frac{2}{5} \quad [2, 5] = 10$$

$$\text{同} \times 10$$

$$15x - 20 = 20x + 4$$

$$-5x = 24$$

$$x = -\frac{24}{5}$$

$$36. \frac{1}{2}x + \frac{2}{3}(150 - x) = 90 \quad [2, 3] = 6$$

$$\text{同} \times 6 \quad 3x + 4(150 - x) = 540$$

$$3x + 600 - 4x = 540$$

$$-x = -60$$

$$x = 60$$

$$37. \frac{(7x-3)}{2} = \frac{(4x-11)}{3} \quad [2, 3] = 6$$

$$\text{同} \times 6 \quad 3(7x-3) = 2(4x-11)$$

$$21x - 9 = 8x - 22$$

$$13x = -13$$

$$x = -1$$

$$38. x - \frac{(5-x)}{3} = 1$$

$$\text{同} \times 3 \quad 3x - (5-x) = 3$$

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

$$4x = 8$$

$$x = 2$$

$$39. \frac{(x-3)}{3} - \frac{(x-6)}{4} = 1 \quad [3, 4] = 12$$

$$\text{同} \times 12$$

$$4(x-3) - 3(x-6) = 12$$

$$4x - 12 - 3x + 18 = 12$$

$$x + 6 = 12$$

$$x = 6$$

$$40. \frac{1}{2}(3x+2) - 4(x-5) = 0$$

$$\text{同} \times 2$$

$$(3x+2) - 8(x-5) = 0$$

$$3x + 2 - 8x + 40 = 0$$

$$-5x + 42 = 0 \rightarrow x = \frac{42}{5}$$

$$-5x = -42$$

$$41. \frac{1}{2}(3x-5) + \frac{1}{3}(x-2) = \frac{7}{2} \quad [2, 3] = 6$$

$$\text{同} \times 6$$

$$3(3x-5) + 2(x-2) = 21$$

$$9x - 15 + 2x - 4 = 21$$

$$11x - 19 = 21$$

$$11x = 40$$

$$x = \frac{40}{11}$$

$$42. \frac{(3x+1)(5x-3)}{2 \cdot 6} = \frac{(x-2)}{4} \quad [2.6.4]=12$$

$$\begin{aligned} \text{同} \times 12 \quad & 6(3x+1) - 2(5x-3) = 3(x-2) \\ & 18x+6-10x+6=3x-6 \\ & 8x+12=3x-6 \\ & 5x=-18 \\ & x=-\frac{18}{5} \end{aligned}$$

$$43. 3x - \frac{(x+1)}{2} = \frac{1}{4} \quad [2.4]=4$$

$$\begin{aligned} \text{同} \times 4 \quad & 12x - 2(x+1) = 1 \\ & 12x - 2x - 2 = 1 \\ & 10x = 3 \\ & x = \frac{3}{10} \end{aligned}$$

$$44. y - \frac{(y-3)}{2} + \frac{(2+3y)}{3} = 1 \quad [2.3]=6$$

$$\begin{aligned} \text{同} \times 6 \quad & 6y - 3(y-3) + 2(2+3y) = 6 \\ & 6y - 3y + 9 + 4 + 6y = 6 \\ & 9y + 13 = 6 \\ & 9y = -7 \\ & y = -\frac{7}{9} \end{aligned}$$

$$51. 2x - \{x + 6[2(x-3) + 4]\} = 10$$

$$\begin{aligned} 2x - \{x + 6[2x - 6 + 4]\} &= 10 \\ 2x - \{x + 12x - 36 + 24\} &= 10 \\ 2x - x - 12x + 36 - 24 &= 10 \\ -11x + 12 &= 10 \quad \rightarrow x = \frac{2}{11} \\ -11x &= -2 \end{aligned}$$

$$52. 8 + \{3x - 4[3(2-3x) + 4]\} = 4x + 3$$

$$\begin{aligned} 8 + \{3x - 4[6 - 9x + 4]\} &= 4x + 3 \\ 8 + \{3x - 24 + 36x - 16\} &= 4x + 3 \\ 8 + 3x - 24 + 36x - 16 &= 4x + 3 \\ 39x - 32 &= 4x + 3 \\ 35x &= 35 \quad x = 1 \end{aligned}$$

$$53. (8x+3) - \{2 - [2(5x-1) + 3] - x\} = -7$$

$$\begin{aligned} 8x+3 - \{2 - [10x-2+3] - x\} &= -7 \\ 8x+3 - \{2 - 10x + 2 - 3 - x\} &= -7 \\ 8x+3 - 2 + 10x - 2 + 3 + x &= -7 \\ 19x + 2 &= -7 \\ 19x &= -9 \quad \rightarrow x = -\frac{9}{19} \end{aligned}$$

$$45. 0.8 - 0.3(2x-1) = 0.2 - 0.3x$$

$$\begin{aligned} 0.8 - 0.6x + 0.3 &= 0.2 - 0.3x \\ -0.6x + 1.1 &= 0.2 - 0.3x \\ -0.3x &= -0.9 \\ x &= 3 \end{aligned}$$

$$46. 0.4(0.2x-0.3) = 0.2(x-3)$$

$$\begin{aligned} 0.08x - 0.12 &= 0.2x - 0.6 \\ \text{同} \times 100 \quad 8x - 12 &= 20x - 60 \\ -12x &= -48 \\ x &= 4 \end{aligned}$$

$$47. \frac{1}{3}x - 0.75 = \frac{1}{3} + 1.25x$$

$$\begin{aligned} \frac{1}{3}x - \frac{3}{4} &= \frac{1}{3} + \frac{5}{4}x \quad [3.4]=12 \\ \text{同} \times 12 \quad 4x - 9 &= 4 + 15x \\ -11x &= 13 \\ x &= -\frac{13}{11} \end{aligned}$$

$$48. 15a - [5a + (3a-1)] = 0$$

$$\begin{aligned} 15a - [5a + 3a - 1] &= 0 \\ 15a - 5a - 3a + 1 &= 0 \\ 7a + 1 &= 0 \\ 7a &= -1 \quad a = -\frac{1}{7} \end{aligned}$$

$$49. -8a + [10 - 3(a+1)] = 0$$

$$\begin{aligned} -8a + [10 - 3a - 3] &= 0 \\ -8a + 10 - 3a - 3 &= 0 \\ -11a + 7 &= 0 \\ -11a &= -7 \\ a &= \frac{7}{11} \end{aligned}$$

$$50. x - 2[-7 + (3x-2)] = 13$$

$$\begin{aligned} x - 2[-7 + 3x - 2] &= 13 \\ x + 14 - 6x + 4 &= 13 \\ -5x + 18 &= 13 \\ -5x &= -5 \\ x &= 1 \end{aligned}$$

54. 小明解 x 的方程式 $mx + 8 = -12$, 得到的解为 $x = 2$, 求 $m = ?$

$$\begin{aligned} x=2 \text{ 代入 } mx+8 &= -12 \\ m \times 2 + 8 &= -12 \\ 2m &= -20 \\ m &= -10 \quad \# \end{aligned}$$

55. $x = -8$ 是方程式 $a(x-4) - 3(x-2) = 6$ 的解, 求 $a = ?$

$$\begin{aligned} x=-8 \text{ 代入 } & \\ a(-8-4) - 3(-8-2) &= 6 \\ -12a + 30 &= 6 \\ -12a &= -24 \quad \rightarrow a = 2 \quad \# \end{aligned}$$

56. 若 x 的方程式 $\frac{x-a}{5} = \frac{1}{3}x - a$ 之解为 $x = 6$, 求 a 之值

$$\begin{aligned} x=6 \text{ 代入 } & \\ \frac{6-a}{5} &= \frac{1}{3} \times 6 - a \\ \frac{6-a}{5} &= 2 - a \\ \text{同} \times 5 \quad 6-a &= 10 - 5a \\ 4a &= 4 \\ a &= 1 \quad \# \end{aligned}$$

57. 若 $5x-2=8$ 與 $-3x-a=8$ 有相同的解，

則(1)共同的解 $x=?$ (2) $a=?$

$$\begin{aligned} (1) \quad 5x-2 &= 8 \\ 5x &= 10 \\ x &= 2 \end{aligned} \quad \begin{aligned} (2) \quad x=2 \text{ 代入 } -3x-a &= 8 \\ -3 \times 2 - a &= 8 \\ -6 - a &= 8 \\ -a &= 14 \\ a &= -14 \end{aligned}$$

58. 若 $3x-(x-1)=3(x+1)$ ，則 $\frac{x-1}{x^2+x+1}=?$

$$\begin{aligned} 3x-x+1 &= 3x+3 \\ 2x+1 &= 3x+3 \\ -x &= 2 \\ x &= -2 \text{ 代入} \end{aligned} \quad \begin{aligned} \frac{(-2)-1}{(-2)^2+(-2)+1} \\ &= \frac{-3}{4-2+1} \\ &= \frac{-3}{3} \\ &= -1 \end{aligned}$$

59. 完成右表

算式 \ x	3	-2
$12-3x$	3	18
$2x+4$	10	0
$\frac{4}{3}x-1$	3	$-\frac{11}{3}$

$$\begin{aligned} 2x+4 &= 10 \\ 2x &= 6 \\ x &= 3 \end{aligned} \quad \begin{aligned} 12-3x &= 18 \\ -3x &= 6 \\ x &= -2 \end{aligned}$$

$$\begin{aligned} 12-3 \times 3 &= 12-9 \\ &= 3 \end{aligned} \quad \begin{aligned} 2 \times (-2) + 4 &= -4+4 \\ &= 0 \end{aligned}$$

$$\begin{aligned} \frac{4}{3} \times 3 - 1 &= 4-1 \\ &= 3 \end{aligned} \quad \begin{aligned} \frac{4}{3} \times (-2) - 1 &= \frac{-8}{3} - \frac{3}{3} \\ &= -\frac{11}{3} \end{aligned}$$

60. 若 $1.79x=70$ ，則 $6997-179x=?$

$$\begin{aligned} 1.79x &= 70 \\ \text{同} \times 100 \\ 179x &= 7000 \text{ 代入} \end{aligned} \quad \begin{aligned} 6997-179x \\ &= 6997-7000 \\ &= -3 \end{aligned}$$

61. 若 $-a+8$ 與 $4a+7$ 互為相反數，求 a 之值

∵ 互為相反數

$$\begin{aligned} \therefore (-a+8) + (4a+7) &= 0 \\ -a+8+4a+7 &= 0 \\ 3a+15 &= 0 \end{aligned} \quad \begin{aligned} 3a &= -15 \\ a &= -5 \end{aligned}$$

62. 若 $\frac{4}{7a-6}$ 與 $3a+1$ 互為倒數，求 a 之值

∵ 互為倒數

$$\begin{aligned} \therefore \frac{4}{7a-6} &= 3a+1 \\ \text{同} \times 4 \quad 7a-6 &= 12a+4 \\ -5a &= 10 \end{aligned} \quad \begin{aligned} a &= -2 \end{aligned}$$

63. 已知 $\frac{3a-5}{4}$ 的倒數為 $-\frac{1}{5}$ ，則 $a=?$

∵ 互為倒數

$$\begin{aligned} \therefore \frac{3a-5}{4} &= -5 \\ 3a-5 &= -20 \\ 3a &= -15 \end{aligned} \quad \begin{aligned} a &= -5 \end{aligned}$$

64. 已知比 -4 大 x 的數是 1 ，則比 x 的 2 倍少 3 的數是多少？

$$\begin{aligned} -4+x &= 1 \\ \Rightarrow x &= 5 \end{aligned} \quad \begin{aligned} 2x-3 \\ &= 2 \times 5 - 3 \\ &= 10-3 \\ &= 7 \end{aligned}$$

65. 已知 $x=-1$ 是方程式 $m+x=4(x-1)$ 的解，且 $x=2$ 是方程式 $8-2n=-3x$ 的解，則 $m+n$ 的值為何？

$$\begin{aligned} x=-1 \text{ 代入} \\ m+(-1) &= 4(-1-1) \\ m-1 &= -8 \\ m &= -7 \end{aligned} \quad \begin{aligned} x=2 \text{ 代入} \\ 8-2n &= -6 \\ -2n &= -14 \\ n &= 7 \end{aligned} \quad \begin{aligned} m+n \\ &= (-7)+7 \\ &= 0 \end{aligned}$$

66. 下表為 x 值與算式的關係，根據表中數據，求 a 、 b 、 c 的值

↓

算式 \ x 值	b	-6	1
$\frac{1}{3}x+a$	-2	2	c

$$\begin{aligned} x=-6 \text{ 代入} \\ \frac{1}{3} \times (-6) + a &= 2 \\ -2+a &= 2 \\ a &= 4 \end{aligned} \quad \begin{aligned} x=b \text{ 代入} \\ \frac{1}{3}b+4 &= -2 \\ \frac{1}{3}b &= -6 \\ b &= -6 \div \frac{1}{3} \\ &= -6 \times \frac{3}{1} \\ &= -18 \end{aligned} \quad \begin{aligned} x=1 \text{ 代入} \\ c &= \frac{1}{3} \times 1 + 4 \\ &= \frac{1}{3} + 4 \\ &= 4\frac{1}{3} \end{aligned}$$

⇒ 算式為 $\frac{1}{3}x+4$