

Solve for 'x' in each equation. **Answers could be fractions.**

Show a solution and underline your final answer.

Use lined paper.

**Knowledge**

1.  $5x + 3 = 18$

2.  $4x - 2 = 7x + 1$

3.  $9 + 7x - 3x = 2x + 3 - x$

4.  $8(x - 2) = 4x + 20$

5.  $\frac{3}{4}x = 9$

6.  $\frac{1}{3}x + \frac{2}{5} = \frac{3}{10}x - 1$

**Thinking**

1.  $2x - (3x + 4) = 6 + 2(3x - 2) + 8x + 3$

2.  $\frac{3x}{7} - x = \frac{5}{14}$

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

4.  $\frac{1}{2}(x+3) + \frac{3}{4}(2x+3) = \frac{7}{8}$

**Application Word Problems**

Solve the following word problems using an algebraic solution involving an equation. Make sure that you write a final statement.

- Two consecutive numbers have a sum of 73. Determine the numbers.
- Julia, Patricia and <sup>Sarah</sup>~~Emma~~ decide to buy an ipod that they will give to Mr. B as a goodbye gift. Julia contributes \$25 more than Patricia. Sarah contributes three times as much as Julia. How much does each person contribute if the cost of the ipod is \$450 ?

**Application Re-arranging formulas 3 marks each ( / 6)**

Re-arrange each formula as directed.

1.  $D = 1 + RT$  into  $R =$

2.  $g = vt^2$  into  $t =$

# SOLVING EQUATIONS REVIEW PART B

## Knowledge

$$(1) 5x + 3 = 18$$

$$5x + 3 - 3 = 18 - 3$$

$$5x = 15$$

$$x = \frac{15}{5}$$

$$\therefore \underline{x = 3}$$

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

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

$$4x = 7x + 3$$

$$4x - 7x = 7x - 7x + 3$$

$$-3x = 3$$

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

$$\therefore \underline{x = -1}$$

$$(3) 9 + 7x - 3x = 2x + 3 - x$$

$$9 + 4x = x + 3$$

$$9 - 9 + 4x = x + 3 - 9$$

$$4x = x - 6$$

$$4x - x = x - x - 6$$

$$3x = -6$$

$$x = -6/3$$

$$\therefore \underline{x = -2}$$

$$(4) 8(x - 2) = 4x + 20$$

$$8x - 16 = 4x + 20$$

$$8x - 16 + 16 = 4x + 20 + 16$$

$$8x = 4x + 36$$

$$8x - 4x = 4x - 4x + 36$$

$$4x = 36$$

$$x = 36/4$$

$$\therefore \underline{x = 9}$$

$$(5) \frac{3}{4}x = 9$$

$$\frac{3}{4}x = \frac{9}{1}$$

$$\frac{3}{4}x = \frac{36}{4} \quad [ \times 4 ]$$

$$3x = 36$$

$$x = 36/3$$

$$\therefore \underline{x = 12}$$

$$(6) \frac{1}{3}x + \frac{2}{5} = \frac{3}{10}x - 1 \quad \text{LCD is 30}$$

$$\frac{10}{10} \times \frac{1}{3}x + \frac{6}{6} \times \frac{2}{5} = \frac{3}{3} \times \frac{3}{10}x - \frac{30}{30} \times 1$$

$$\frac{10}{30}x + \frac{12}{30} = \frac{9}{30}x - \frac{30}{30} \quad [ \times 30 ]$$

$$10x + 12 = 9x - 30$$

$$10x - 9x = -30 - 12$$

$$\underline{x = -42}$$

# Thinking

$$\textcircled{1} \quad 2x - (3x+4) = 6 + 2(3x-2) + 8x + 3$$

$$2x - 3x - 4 = 6 + 6x - 4 + 8x + 3$$

$$-x - 4 = 14x + 5$$

$$-x - 4 + 4 = 14x + 5 + 4$$

$$-x = 14x + 9$$

$$-x - 14x = 14x - 14x + 9$$

$$-15x = 9$$

$$x = \frac{9}{-15} \quad \therefore x = -\frac{3}{5} \text{ or } -0.6$$

$$\textcircled{2} \quad \frac{3x}{7} - x = \frac{5}{14}$$

$$\frac{3x}{7} - \frac{x}{1} = \frac{5}{14}$$

$$\frac{2}{2} \times \frac{3x}{7} - \frac{14}{14} \times \frac{x}{1} = \frac{5}{14}$$

$$[\times 14] \quad \frac{6x}{14} - \frac{14x}{14} = \frac{5}{14}$$

$$6x - 14x = 5$$

$$-8x = 5$$

$$x = -\frac{5}{8}$$

$$\textcircled{3} \quad \frac{(2x-1)}{2} - \frac{(x-3)}{4} = \frac{(5-3x)}{8}$$

$$\frac{4(2x-1)}{4 \times 2} - \frac{2(x-3)}{2 \times 4} = \frac{(5-3x)}{8}$$

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

$$8x-4 - 2(x-3) = 5-3x$$

$$8x-4 - 2x+6 = 5-3x$$

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

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

$$9x = 3$$

$$x = \frac{3}{9}$$

$$\therefore x = \frac{1}{3}$$

$$\textcircled{4} \quad \frac{1}{2}(x+3) + \frac{3}{4}(2x+3) = \frac{7}{8} \quad \text{LCD is } 8$$

$$\frac{4}{4} \times \frac{1}{2}(x+3) + \frac{2}{2} \times \frac{3}{4}(2x+3) = \frac{7}{8}$$

$$\frac{4}{8}(x+3) + \frac{6}{8}(2x+3) = \frac{7}{8} \quad [\times 8]$$

$$4(x+3) + 6(2x+3) = 7$$

$$4x+12 + 12x+18 = 7$$

$$16x + 30 = 7$$

$$16x = 7-30$$

$$16x = -23$$

$$\therefore x = -\frac{23}{16} \text{ or } -1\frac{7}{16}$$

## APPLICATIONS WORD PROBLEMS

- ① let  $x$  be one of the numbers. ✓  
let  $(x+1)$  be the other one. ✓

$$x + (x+1) = 73 \quad ✓$$

$$2x + 1 = 73$$

$$2x = 73 - 1$$

$$2x = 72 \quad ✓$$

$$x = 72/2$$

$$\therefore \underline{x = 36} \quad ✓$$

$$x+1 = 36+1$$

$$= 37 \quad ✓$$

$\therefore$  The two numbers are  
36 and 37. ✓

- ② let Felicia's contribution be  $x$ . ✓

let Julian's " be  $x+25$  ✓

let Sarah's " be  $3(x+25)$  ✓

$$x + x+25 + 3(x+25) = 450 \quad ✓$$

$$2x+25 + 3x+75 = 450$$

$$5x + 100 = 450$$

$$5x = 450 - 100 \quad ✓$$

$$5x = 350$$

$$x = 350/5$$

$$\underline{x = 70} \text{ (Felicia)} \quad ✓$$

Julian

$$x+25 = 70+25 \\ = 95$$

Sarah

$$3(x+25) = 3(70+25) \quad ✓ \\ = 3(95) \\ = 285$$

$\therefore$  Felicia contributes \$70,  
Julian \$95 and  
Sarah \$285 for the iPad. ✓