

Solve for 'x' in each equation.  
Show a full solution and underline your final answer.  
Use lined paper.

**Knowledge questions**

1.  $2x - 5 = 13$
2.  $3x + 2 = 8x + 12$
3.  $10 - 4x = 7x + 21$
4.  $3(x + 2) = 15$
5.  $\frac{2}{3}x = 8$
6.  $\frac{1}{2}x + \frac{3}{5} = \frac{3}{4}x - 2$

**Thinking questions**

1.  $2(5x - 3) + 3 = 3 - 2(x - 3)$
2.  $4x - 3 - 2(x + 5) = 5 - 7x - 3$
3.  $\frac{4x + 3}{5} - \frac{x - 3}{2} = 6$
4.  $\frac{2}{3}(3x - 1) + 2 = \frac{1}{4}(x + 1)$

**Application Problems**

Use a variable and an equation to solve.  
Don't forget to write a sentence for your final answer.

1. The price of a movie ticket today is **\$12.50**. This is **\$4.25 more** than **eleven times** the price for a ticket in the early 1970's when Mr. Biss was a teenager. Determine how much Mr. Biss had to pay for one ticket way back then to go to the movies.
2. Jacob, Tristan and Jonathan decide to buy Mr. Biss a pre-end of the course gift. Tristan is chipping in \$200 less than three times what Jacob is contributing. Jonathan is chipping in twice as much as Tristan. Altogether they come up with \$640 for the gift.

How much each of them contribute for the gift?

# SOLVING EQUATIONS REVIEW PART A

## Knowledge Questions

1.  $2x - 5 = 13$

$$2x = 13 + 5$$

$$2x = 18$$

$$x = 18/2$$

$$\underline{x = 9}$$

2.  $3x + 2 = 8x + 12$

$$3x - 8x + 2 = 12$$

$$-5x + 2 = 12$$

$$-5x = 12 - 2$$

$$-5x = 10$$

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

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

3.  $\frac{2}{3}x = 8$

$$3\left(\frac{2}{3}\right)x = 8(3)$$

$$2x = 24$$

$$x = \frac{24}{2}$$

$$\underline{x = 12}$$

4.  $3(x+2) = 15$

$$3x + 6 = 15$$

$$3x = 15 - 6$$

$$3x = 9$$

$$x = 9/3$$

$$\underline{x = 3}$$

5.  $10 - 4x = 7x + 21$

$$10 - 4x - 7x = 21$$

$$-11x = 21$$

$$-11x = 21 - 10$$

$$-11x = 11$$

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

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

6.  $\frac{1}{2}x + \frac{3}{5} = \frac{3}{4}x - 2$

$$^{10}20\left(\frac{1}{2}\right)x + ^420\left(\frac{3}{5}\right) = ^520\left(\frac{3}{4}\right)x - 20(2)$$

$$10x + 4(3) = 5(3x) - 40$$

$$10x + 12 = 15x - 40$$

$$10x - 15x + 12 = -40$$

$$-5x + 12 = -40$$

$$-5x = -40 - 12$$

$$-5x = -52$$

$$\frac{-5x}{-5} = \frac{-52}{-5}$$

$$x = 52/5 \text{ or } 10\frac{2}{5}$$

## Thinking Questions

$$\boxed{1} \quad 2(5x-3) + 3 = 3 - 2(x-3)$$

$$10x - 6 + 3 = 3 - 2x + 6$$

$$10x - 3 = 9 - 2x$$

$$10x + 2x - 3 = 9$$

$$12x - 3 = 9$$

$$12x = 9 + 3$$

$$12x = 12$$

$$x = 12/12$$

$$\underline{x = 1}$$

$$\boxed{2} \quad 4x - 3 - 2(x+5) = 5 - 7x - 3$$

$$4x - 3 - 2x - 10 = 2 - 7x$$

$$2x - 13 = 2 - 7x$$

$$2x + 7x - 13 = 2$$

$$9x - 13 = 2$$

$$9x = 2 + 13$$

$$9x = 15$$

$$x = 15/9$$

$$\underline{x = 5/3}$$

$$\boxed{3} \quad \frac{4x+3}{5} - \frac{x-3}{2} = 6$$

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

$$2(4x+3) - 5(x-3) = 60$$

$$8x + 6 - 5x + 15 = 60$$

$$3x + 21 = 60$$

$$3x = 60 - 21$$

$$3x = 39$$

$$x = 39/3$$

$$\underline{x = 13}$$

$$\boxed{4} \quad \frac{2}{3}(3x-1) + 2 = \frac{1}{4}(x+1)$$

$$^4 \cancel{12} \left( \frac{2}{3} \right) (3x-1) + ^4 \cancel{12} (2) = ^3 \cancel{12} \left( \frac{1}{4} \right) (x+1)$$

$$8(3x-1) + 24 = 3(x+1)$$

$$24x - 8 + 24 = 3x + 3$$

$$24x + 16 = 3x + 3$$

$$24x - 3x + 16 = 3$$

$$21x + 16 = 3$$

$$21x = 3 - 16$$

$$21x = -13$$

$$\underline{x = \frac{-13}{21}}$$

## Application Problem (5 marks each)

① let 'p' represent the price of a ticket from the early '70s. ✓

$$11p + 4.25 = 12.50 \quad \checkmark$$

$$11p = 12.50 - 4.25$$

$$11p = 8.25 \quad \checkmark$$

$$p = \frac{8.25}{11}$$

$$p = 0.75 \quad \checkmark$$

✓ ∴ The price of a movie ticket from the early '70s was \$0.75.

② let 'x' represent the amount Jacob chips in for the gift.

let  $2(3x - 200)$  represent Jonathan's contribution.

let  $3x - 200$  represent Tristan's effort.

$$3x - 200 + 2(3x - 200) + x = 640$$

$$3x - 200 + 6x - 400 + x = 640$$

$$10x - 600 = 640$$

$$10x = 640 + 600$$

$$10x = 1240$$

$$x = \underline{\underline{\$124}}$$

$$\begin{aligned} \text{Tristan} &= 3(124) - 200 \\ &= 372 - 200 \\ &= 172 \end{aligned}$$

$$\begin{aligned} \text{Jonathan} &= 2 \times 172 \\ &= 344 \end{aligned}$$

∴ Jacob chips in \$124,

Tristan chips in \$172 and

Jonathan chips in \$344.

$$\begin{aligned} \text{Check } & 124 + 172 + 344 \\ & = 640 \quad \checkmark \end{aligned}$$