

Equations - Introduction

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Introduction to equations

Write the number in the box that makes the number statement true.

Write the problem as an equation.

$$\boxed{6} + 7 = 13$$

$$x + 7 = 13 \quad x = 6$$

$$12 - \boxed{4} = 8$$

$$12 - x = 8 \quad x = 4$$

$$\boxed{8} + 6 = 14$$

$$x + 6 = 14 \quad x = 8$$

$$\boxed{10} - 4 = 6$$

$$x - 4 = 6 \quad x = 10$$

$$\boxed{6} + 8 = 14$$

$$x + 8 = 14 \quad x = 6$$

$$11 - \boxed{5} = 6$$

$$11 - x = 6 \quad x = 5$$

$$9 + \boxed{3} = 12$$

$$9 + x = 12 \quad x = 3$$

$$\boxed{10} - 7 = 3$$

$$x - 7 = 3 \quad x = 10$$

The numbers must be the same

$$\boxed{5} + \boxed{5} = 10$$

$$x + x = 10 \quad \text{or} \quad 2x = 10 \quad x = 5$$

$$\boxed{7} + \boxed{7} = 14$$

$$x + x = 14 \quad 2x = 14 \quad x = 7$$

$$\boxed{4} + \boxed{4} + \boxed{4} = 12$$

$$x + x + x = 12 \quad 3x = 12 \quad x = 4$$

$$\boxed{6} + \boxed{6} + \boxed{6} = 18$$

$$x + x + x = 18 \quad 3x = 18 \quad x = 6$$

Solve these equations

$$1 \quad x + 2 = 10 \quad x = 8$$

$$2 \quad a - 1 = 8 \quad a = 9$$

$$3 \quad b + 7 = 12 \quad b = 5$$

$$4 \quad 12 - x = 8 \quad x = 4$$

$$5 \quad 5 + c = 7 \quad c = 2$$

$$6 \quad 2x = 6 \quad x = 3$$

$$7 \quad 3x = 6 \quad x = 2$$

$$8 \quad 10 - x = 7 \quad x = 3$$

$$9 \quad 2x + 1 = 9 \quad x = 4$$

$$10 \quad 2x - 1 = 5 \quad x = 3$$

Equations

some x's = a number

$$1) x = 36$$

$$2) 2x = 36 \quad x = \frac{36}{2} = 18$$

$$3) 3x = 36 \quad x = \frac{36}{3} = 12$$

$$4) 4x = 36 \quad x = \frac{36}{4} = 9$$

$$5) 5x = 36 \quad x = \frac{36}{5} = 7.2$$

$$6) 6x = 36 \quad x = \frac{36}{6} = 6$$

$$7) 36 = 9x \quad x = \frac{36}{9} = 4$$

$$8) 36 = 12x \quad x = \frac{36}{12} = 3$$

$$9) \frac{x}{2} = 36 \quad x = 36 \times 2 = 72$$

$$10) \frac{x}{3} = 36 \quad x = 36 \times 3 = 108$$

some x's plus a number = a number

$$1) x + 2 = 20 \quad x = 18$$

$$2) 2x + 2 = 20 \quad 2x = 18 \\ 18 + 2 = 20 \quad x = 9$$

$$3) 2 + 3x = 20 \quad 3x = 18 \\ 2 + 18 = 20 \quad x = 6$$

$$4) 4x + 2 = 20 \quad 4x = 18 \\ 18 + 2 = 20 \quad x = \frac{18}{4} = 4.5$$

$$5) \frac{x}{2} + 2 = 20 \quad \frac{x}{2} = 18 \\ 18 + 2 = 20 \quad x = 18 \times 2 = 36$$

$$6) 20 = 6x + 2 \quad 6x = 18 \\ 20 = 18 + 2 \quad x = 3$$

Bonus Questions

$$1) 7x - 2 = 19$$

$$7x = 21$$

$$x = 3$$

$$2) 4x + 1 = 17$$

$$4x = 16$$

$$x = 4$$

$$3) 23 = 4x - 5$$

$$4x = 28$$

$$x = 7$$

some x's take a number = a number

$$1) x - 3 = 21 \quad x = 24$$

$$2) 2x - 3 = 21 \quad 2x = 24 \quad x = 12$$

$$3) 3x - 3 = 21 \quad 3x = 24 \quad x = 8$$

$$4) 4x - 3 = 21 \quad 4x = 24 \quad x = 6$$

$$5) \frac{x}{2} - 3 = 21 \quad \frac{x}{2} = 24 \quad x = 48$$

$$6) 21 = 6x - 3 \quad 6x = 24 \quad x = 4$$

Put the number in the box that makes the statement true. Then solve for x

1 $\begin{array}{|c|} \hline 2x \\ \hline 12 \\ \hline \end{array} + 1 = 13$ $x = 6$

7 $\begin{array}{|c|} \hline 6x \\ \hline 12 \\ \hline \end{array} + 1 = 13$ $x = 2$

13) $6x + 2 = 8$
 $6 + 2 = 8$
 $6x = 6$ $x = 1$

2 $\begin{array}{|c|} \hline 3x \\ \hline 9 \\ \hline \end{array} - 2 = 7$ $x = 3$

8 $\begin{array}{|c|} \hline 5x \\ \hline 20 \\ \hline \end{array} - 2 = 18$ $x = 4$

14) $3x + 3 = 15$
 $12 + 3 = 15$
 $3x = 12$
 $x = 4$

3 $\begin{array}{|c|} \hline 4x \\ \hline 20 \\ \hline \end{array} - 1 = 19$ $x = 5$

9 $\begin{array}{|c|} \hline 7x \\ \hline 14 \\ \hline \end{array} - 1 = 13$ $x = 2$

15) $4x + 2 = 10$
 $8 + 2 = 10$
 $4x = 8$ $x = 2$

4 $\begin{array}{|c|} \hline 5x \\ \hline 10 \\ \hline \end{array} + 3 = 13$ $x = 2$

10 $10 - \begin{array}{|c|} \hline 2x \\ \hline 4 \\ \hline \end{array} = 6$ $x = 2$

16) $2x - 5 = 5$
 $10 - 5 = 5$
 $2x = 10$
 $x = 5$

5 $\begin{array}{|c|} \hline 2x \\ \hline 12 \\ \hline \end{array} - 7 = 5$ $x = 6$

11 $14 - \begin{array}{|c|} \hline 3x \\ \hline 9 \\ \hline \end{array} = 5$ $x = 3$

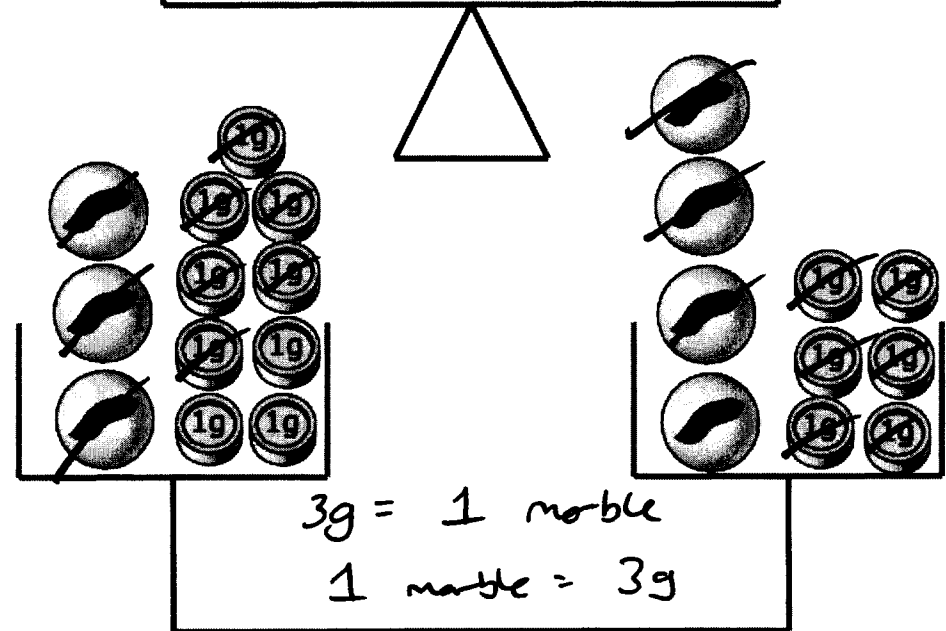
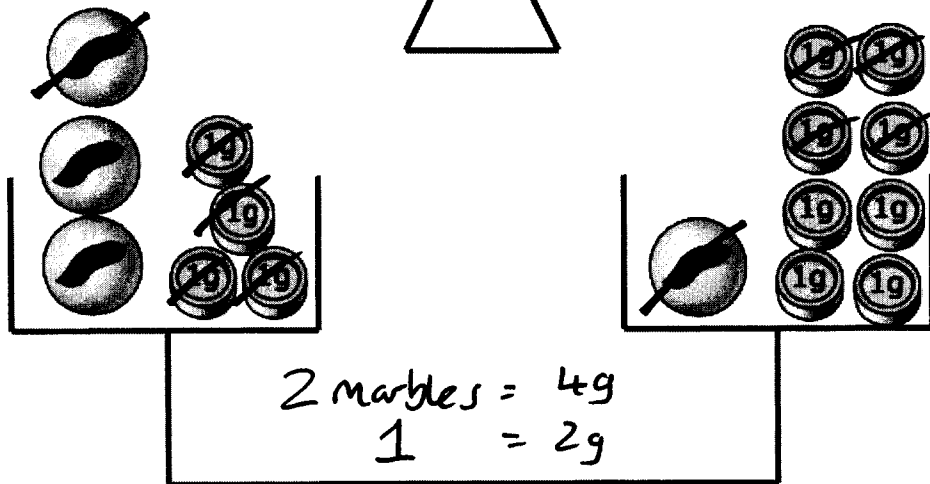
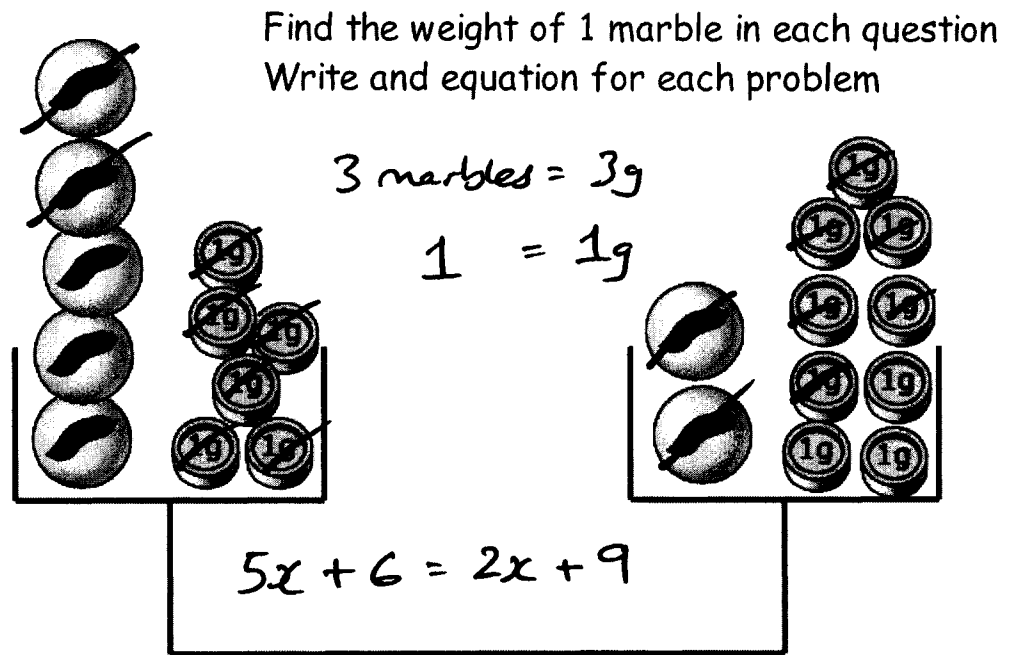
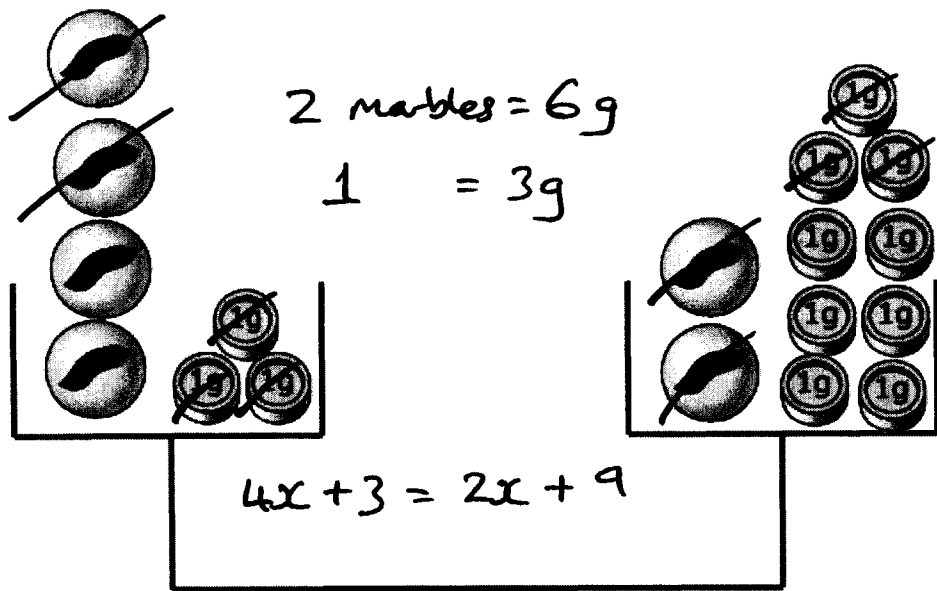
17) $\frac{x}{2} - 2 = 4$
 $6 - 2 = 4$
 $x/2 = 6$ $x = 12$

6 $\begin{array}{|c|} \hline 3x \\ \hline 9 \\ \hline \end{array} + 4 = 13$ $x = 3$

12 $14 - \begin{array}{|c|} \hline 4x \\ \hline 4 \\ \hline \end{array} = 10$ $x = 1$

18) $17 = 2x - 3$
 $17 = 20 - 3$
 $2x = 20$
 $x = 10$

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1 Arranging for x's = numbers or numbers = x's $7x = 21$ or $21 = 7x$

2 Which side of the equals has the most x's or to start with?

Qu 1	$5x - 2 = 12 - 2x$
x's	left
numbers	right
+2x	$7x - 2 = 12$
+2	$7x = 14$
÷7	$x = 2$

Qu 5	$7x - 2 = 3x + 14$
x's	L
numbers	R
-3x	$4x - 2 = 14$
+2	$4x = 16$
÷4	$x = 4$

Qu 9	$3x + 17 = 5x + 3$
x's	R
numbers	L
-3x	$17 = 2x + 3$
-3	$14 = 2x$
÷2	$x = 7$

Qu 2	$4x + 2 = 2x + 14$
x's	Left
numbers	Right
-2x	$2x + 2 = 14$
-2	$2x = 12$
÷2	$x = 6$

Qu 6	$6x - 1 = 4x + 11$
x's	L
numbers	R
-4x	$2x - 1 = 11$
+1	$2x = 12$
÷2	$x = 6$

Qu 10	$7x - 3 = 4x + 27$
x's	L
numbers	R
-4x	$3x - 3 = 27$
+3	$3x = 30$
÷3	$x = 10$

Qu 3	$6x - 1 = 3x + 14$
x's	Left
numbers	Right
-3x	$3x - 1 = 14$
+1	$3x = 15$
÷3	$x = 5$

Qu 7	$7x + 2 = 2x + 17$
x's	L
numbers	R
-2x	$5x + 2 = 17$
-2	$5x = 15$
÷5	$x = 3$

Qu 11	$4 + 7x = 20 - x$
x's	L
numbers	R
+x	$4 + 8x = 20$
-4	$8x = 16$
÷8	$x = 2$

Qu 4	$2x + 12 = 5x + 3$
x's	Right
numbers	Left
-2x	$12 = 3x + 3$
-3	$9 = 3x$
÷3	$x = 3$

Qu 8	$8x - 3 = 3x + 17$
x's	L
numbers	R
-3x	$5x - 3 = 17$
+3	$5x = 20$
÷5	$x = 4$

Qu 12	$20 - 2x = 4 + 2x$
x's	Right
numbers	Left
+2x	$20 = 4 + 4x$
-4	$16 = 4x$
÷4	$x = 4$

3 Move the x's to this side.

4 Move the numbers to the other side.

5 To move and 'add' term take, a 'take' term add.

(5)

"x" on both sides of the equals sign

All terms are POSITIVE

$$1 \quad \underline{4x} + 17 = 2x + 24$$

$$\begin{array}{r} -2x \\ -17 \\ \hline 2x + 17 = 24 \\ 2x = 7 \\ \div 2 \\ x = 3.5 \end{array}$$

$$2 \quad \underline{8x} + 11 = 6x + 27$$

$$\begin{array}{r} -6x \\ -11 \\ \hline 2x + 11 = 27 \\ 2x = 16 \\ \div 2 \\ x = 8 \end{array}$$

$$3 \quad \underline{10x} + 3 = 7x + 39$$

$$\begin{array}{r} -7x \\ -3 \\ \hline 3x + 3 = 39 \\ 3x = 36 \\ \div 3 \\ x = 12 \end{array}$$

$$4 \quad \underline{5x} + 19 = 3x + 32$$

$$\begin{array}{r} -3x \\ -19 \\ \hline 2x + 19 = 32 \\ 2x = 13 \\ \div 2 \\ x = 6.5 \end{array}$$

$$5 \quad 4x + 75 = \underline{10x} + 9$$

$$\begin{array}{r} -4x \\ -9 \\ \hline 75 = 6x + 9 \\ 66 = 6x \\ \div 6 \\ x = 11 \end{array}$$

$$6 \quad \underline{13x} + 5 = 8x + 15$$

$$\begin{array}{r} -8x \\ -5 \\ \hline 5x + 5 = 15 \\ 5x = 10 \\ \div 5 \\ x = 2 \end{array}$$

$$7 \quad x + 12 = \underline{3x} + 4$$

$$\begin{array}{r} -x \\ -4 \\ \hline 12 = 2x + 4 \\ 8 = 2x \\ \div 2 \\ x = 4 \end{array}$$

$$8 \quad 2x + 23 = 14 + \underline{5x}$$

$$\begin{array}{r} -2x \\ -14 \\ \hline 23 = 14 + 3x \\ 9 = 3x \\ \div 3 \\ x = 3 \end{array}$$

$$9 \quad 3x + 17 = \underline{5x} + 1$$

$$\begin{array}{r} -3x \\ -1 \\ \hline 17 = 2x + 1 \\ 16 = 2x \\ \div 2 \\ x = 8 \end{array}$$

$$10 \quad x + 19 = \underline{6x} + 4$$

$$\begin{array}{r} -x \\ -4 \\ \hline 19 = 5x + 4 \\ 15 = 5x \\ \div 5 \\ x = 3 \end{array}$$

$$11 \quad 5 + \underline{4x} = x + 20$$

$$\begin{array}{r} -x \\ -5 \\ \hline 5 + 3x = 20 \\ 3x = 15 \\ \div 3 \\ x = 5 \end{array}$$

$$12 \quad 2x + 13 = \underline{8x} + 1$$

$$\begin{array}{r} -2x \\ -1 \\ \hline 13 = 6x + 1 \\ 12 = 6x \\ \div 6 \\ x = 2 \end{array}$$

A mixture of positive and negative terms

$$13 \quad \underline{5x} - 2 = 3x + 10 \quad \begin{array}{l} 2x = 12 \\ x = 6 \end{array}$$

$$19 \quad 8 - \underline{x} = 12 - 2x \quad x = 4$$

$$14 \quad 2x + 12 = \underline{4x} - 8 \quad \begin{array}{l} 20 = 2x \\ x = 10 \end{array}$$

$$20 \quad \underline{8x} - 5 = 3x - 15 \quad \begin{array}{l} 5x = -10 \\ x = -2 \end{array}$$

$$15 \quad \underline{7x} + 1 = 17 - x \quad \begin{array}{l} 8x = 16 \\ x = 2 \end{array}$$

$$21 \quad \underline{7x} - 2 = 2x + 2 \quad \begin{array}{l} 5x = 4 \\ x = 4/5 = 0.8 \end{array}$$

$$16 \quad 20 - 2x = \underline{2x} + 4 \quad \begin{array}{l} 16 = 4x \\ x = 4 \end{array}$$

$$22 \quad 8 - 2x = 10 + \underline{2x} \quad \begin{array}{l} -2 = 4x \\ x = -2/4 = -0.5 \end{array}$$

$$17 \quad \underline{7x} - 2 = 8 - 3x \quad \begin{array}{l} 10x = 10 \\ x = 1 \end{array}$$

$$23 \quad 15 - x = \underline{2x} + 15 \quad 0 = 3x \quad x = 0$$

$$18 \quad 13 - 3x = \underline{3x} - 5 \quad \begin{array}{l} 18 = 6x \\ x = 3 \end{array}$$

$$24 \quad -8 - \underline{5x} = -14 - 7x \quad \begin{array}{l} 2x = -6 \\ x = -3 \end{array}$$

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