

SOLVING EQUATIONS (LINEAR)

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Worked example

Solve:

$$x + 2 = 3$$

$$x - 2 = 3$$

$$3 = 2 + x$$

$$3 = -2 + x$$

$$2x = 10$$

$$2 = 10x$$

$$-x = 3$$

$$-2 = -x$$

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

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

Your turn

Solve:

$$a - 3 = 7$$

$$a = 10$$

$$7 = \frac{b}{-3}$$

$$b = -21$$

$$21 = -3c$$

$$c = -7$$

$$-d = 7$$

$$d = -7$$

Worked example

Solve:

$$x + 2 = 3$$

$$3 = x - 2$$

$$3 = 2 + x$$

$$-2 + x = 3$$

Your turn

Solve:

$$5 = -2 + x$$

$$x = 7$$

Worked example

Solve:

$$2x = 6$$

$$10 = 2x$$

$$\frac{x}{2} = 6$$

$$2 = \frac{x}{10}$$

Your turn

Solve:

$$4x = 8$$

$$x = 2$$

$$4 = \frac{x}{8}$$

$$x = 32$$

Worked example

Solve:

$$\frac{1}{3}x = 5$$

$$7 = \frac{1}{2}x$$

Your turn

Solve:

$$\frac{1}{5}x = 4$$

$$x = 20$$

Worked example

Solve:

$$-x = 3$$

$$2 = -x$$

$$-5 = -x$$

$$-x = -4$$

Your turn

Solve:

$$-x = 7$$

$$x = -7$$

$$-6 = -x$$

$$x = 6$$

Worked example

Solve:

$$3x + 2 = 14$$

$$12 = 5x - 3$$

Your turn

Solve:

$$19 = 4x - 5$$

$$x = 6$$

Worked example

Solve:

$$2 - 3x = 14$$

$$12 = -5x - 3$$

Your turn

Solve:

$$19 = -4x - 5$$

$$x = -6$$

Worked example

Solve:

$$-\frac{x}{5} = 3$$

$$\frac{x}{-2} = 5$$

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

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

Your turn

Solve:

$$\frac{x}{-5} = 7$$
$$x = -35$$

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

Worked example

Solve:

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

$$7 = -\frac{1}{2}x$$

Your turn

Solve:

$$-\frac{1}{5}x = 4$$

$$x = -20$$

Worked example

Solve:

$$2 + \frac{x}{3} = 14$$

$$12 = -\frac{x}{5} - 3$$

Your turn

Solve:

$$19 = -\frac{x}{4} - 5$$

$$x = -96$$

Worked example

Solve:

$$\frac{2x + 3}{4} = 5$$

$$\frac{5x - 4}{3} = 2$$

Your turn

Solve:

$$\frac{3x - 1}{5} = 4$$

$$x = 7$$

Worked example

Solve:

$$\frac{5 - 4x}{3} = 2$$

Your turn

Solve:

$$\frac{2 - 3x}{4} = 5$$

$$x = -6$$

Worked example

Solve:

$$2(3x + 4) - 5 = 17$$

$$6(5x - 4) + 3 = 27$$

Your turn

Solve:

$$5(4x - 3) + 2 = 17$$

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

Worked example

I think of a number:

- I multiply the number by 6
- then subtract 3
- then divide by 5

The result is 3

What was my original number?

Your turn

I think of a number:

- I multiply the number by 4
- then subtract 5
- then divide by 3

The result is 9

What was my original number?

8

Worked example

A is x years old.
 B is 8 years older than A .
 C is three times older than B .
The sum of the ages of A , B and C is 67.
What are their ages?

Your turn

R is x years old.
 S is ten years younger than R .
 T is double R 's age.
The sum of the ages of R , S and T is 54.
What are their ages?

R – 16 years old

S – 6 years old

T – 32 years old

Worked example

The mean of three numbers is 5.
One number is 7 and one is 6.
Find the third number.

Your turn

The mean of four numbers is 5.
One number is 7, one is 6 and
another is 3. Find the fourth
number.

4

Worked example

Solve:

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

Your turn

Solve:

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

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

Worked example

Solve:

$$3(x + 2) = 12$$

$$2(x - 3) = 12$$

Your turn

Solve:

$$3(x - 2) = 12$$

$$x = 6$$

Worked example

Solve:

$$-2(x - 3) = 12$$

$$-3(2 - x) = 12$$

Your turn

Solve:

$$-5(4 - x) = 20$$

$$x = 8$$

Worked example

Solve:

$$\frac{12}{x} = 3$$

$$\frac{3}{x} = 12$$

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

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

Your turn

Solve:

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

$$x = 2$$

$$\frac{4}{x} = 24$$

$$x = \frac{1}{6}$$

Worked example

Solve:

$$\frac{12}{x+2} = 3$$

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

$$5 = \frac{10}{x+3}$$

$$10 = \frac{5}{x-3}$$

Your turn

Solve:

$$\frac{14}{x+5} = 7$$

$$x = -3$$

$$\frac{4}{x-5} = 24$$

$$x = \frac{31}{6} \text{ or } 3\frac{1}{6}$$

Worked example

Solve:

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

$$\frac{2}{5x} = 4$$

Your turn

Solve:

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

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

Worked example

Solve:

$$\frac{4}{3x - 1} = 2$$

$$\frac{2}{5x + 3} = 4$$

Your turn

Solve:

$$\frac{3}{4x - 5} = 2$$

$$x = \frac{13}{8}$$

Worked example

Solve:

$$2x + 3 = x + 5$$

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

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

Your turn

Solve:

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

$$x = 2$$

Worked example

Solve:

$$1 - x = 3x - 7$$

$$3x - 5 = 5 - 2x$$

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

Your turn

Solve:

$$2x - 3 = 11 - 5x$$

$$x = 2$$

Worked example

Solve:

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

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

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

Your turn

Solve:

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

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

Worked example

Solve:

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

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

Your turn

Solve:

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

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

Worked example

Solve:

$$7x = 5x + 2$$

$$5x + 8 = 6x$$

Your turn

Solve:

$$6x = 2x + 12$$

$$x = 3$$

Worked example

Solve:

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

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

Your turn

Solve:

$$6x = -2x + 12$$

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

Worked example

Solve:

$$7x + 3 = 5x + 11$$

$$3x + 7 = 7x + 3$$

Your turn

Solve:

$$5x + 2 = 2x + 17$$

$$x = 5$$

Worked example

Solve:

$$7x + 3 = -5x + 11$$

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

Your turn

Solve:

$$5x + 2 = -2x + 17$$

$$x = \frac{15}{7}$$

Worked example

Solve:

$$-7x + 3 = -5x + 11$$

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

Your turn

Solve:

$$-5x + 2 = -2x + 17$$

$$x = -5$$

Worked example

Solve:

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

$$2x + 1 = 5(4x - 3)$$

Your turn

Solve:

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

$$x = \frac{11}{5}$$

Worked example

Solve:

$$3(4x - 2) = 5(x - 6)$$

$$6(2 - 3x) = 4(x + 5)$$

Your turn

Solve:

$$3(5 - 2x) = 4(x + 6)$$

$$x = -\frac{9}{10}$$

Worked example

Solve:

$$2(3x + 4) + 5(6x - 7) = 8$$

Your turn

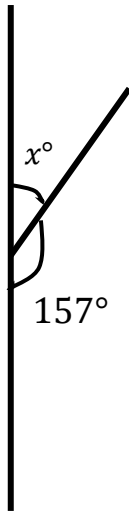
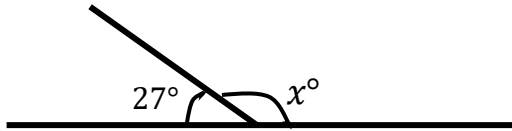
Solve:

$$8(7x - 6) + 5(4x + 3) = 2$$

$$x = \frac{35}{76}$$

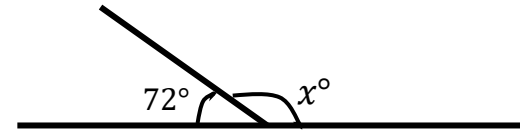
Worked example

Find x



Your turn

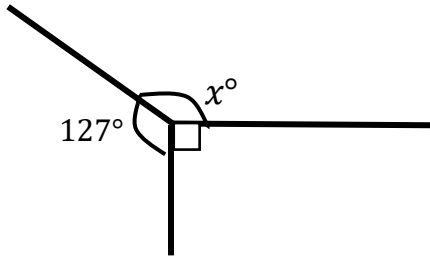
Find x



$$x = 108$$

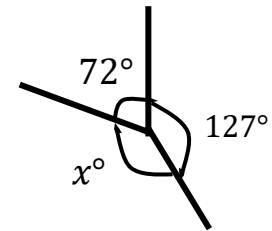
Worked example

Find x



Your turn

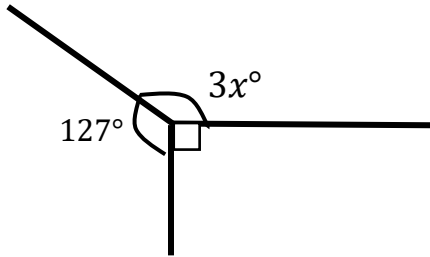
Find x



$$x = 161$$

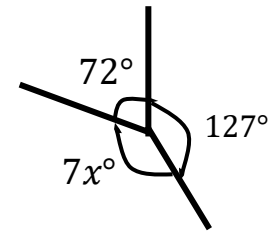
Worked example

Find x



Your turn

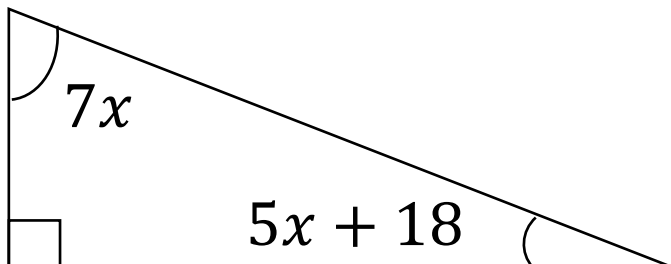
Find x



$$x = 23$$

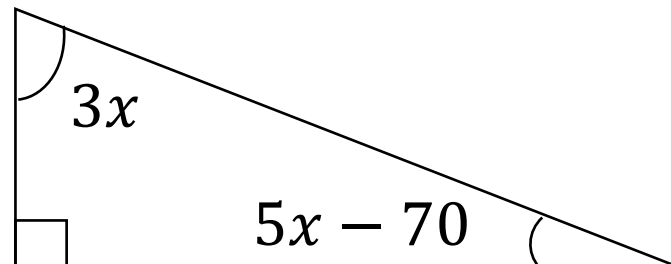
Worked example

Find x



Your turn

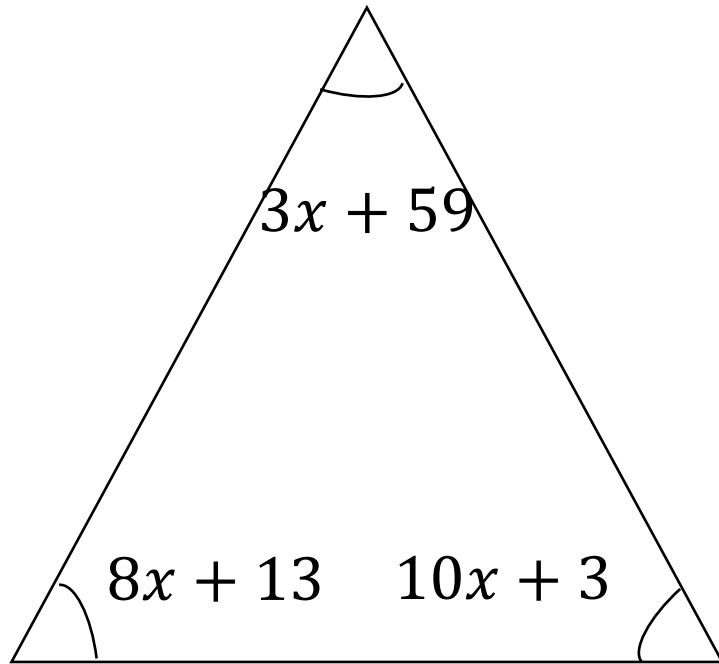
Find x



$$x = 20^\circ$$

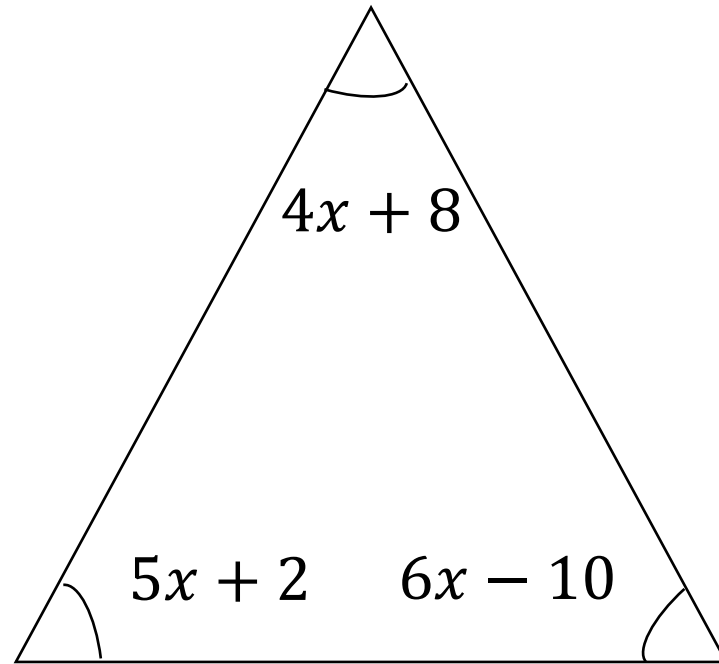
Worked example

Find x



Your turn

Find x



$$x = 12^\circ$$

Worked example

Find x

$$2x - 1$$



$$5x - 7$$

Your turn

Find x

$$4x - 3$$



$$2x + 9$$

$$x = 6$$

Worked example

Find y

$$2x - 1$$

$$y + 8$$



$$5x - 7$$

$$3y - 4$$

Your turn

Find y

$$4x - 3$$

$$3y - 8$$



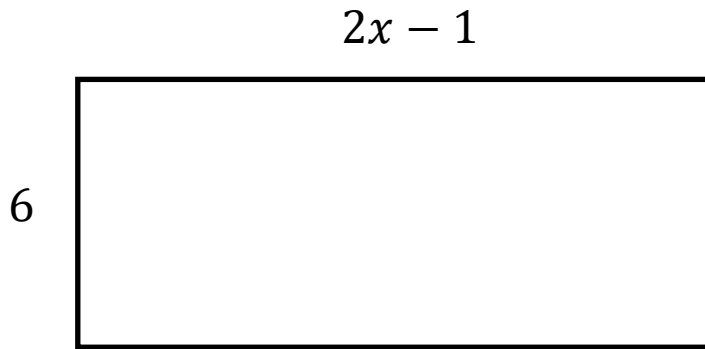
$$y + 12$$

$$2x + 9$$

$$y = 10$$

Worked example

The area of the rectangle is equal to 24 square units. Find x



Your turn

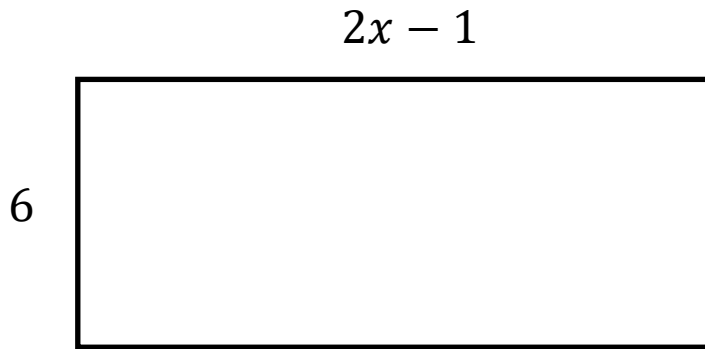
The area of the rectangle is equal to 72 square units. Find x



$$x = \frac{14}{3}$$

Worked example

The perimeter of the rectangle is equal to 24 square units. Find x



Your turn

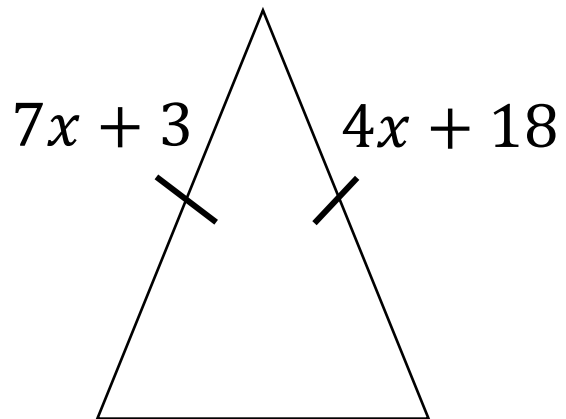
The perimeter of the rectangle is equal to 72 square units. Find x



$$x = \frac{32}{3}$$

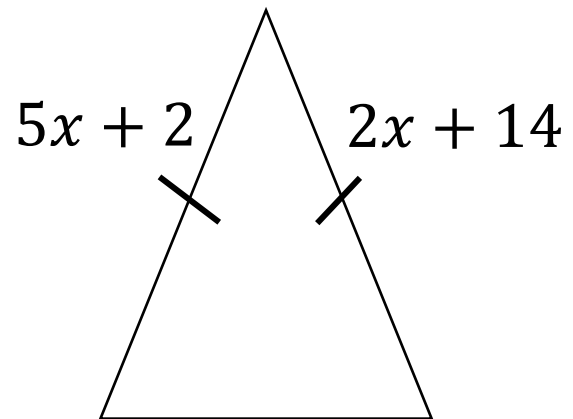
Worked example

Find x :



Your turn

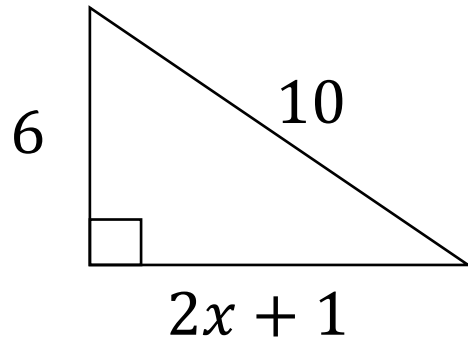
Find x :



$$x = 4$$

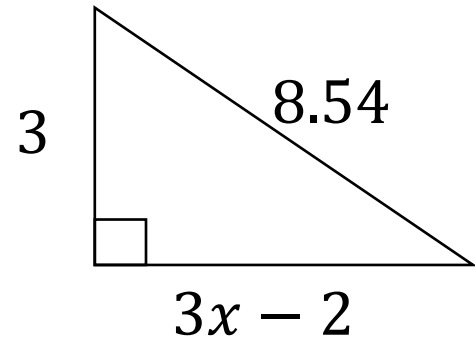
Worked example

The area of the triangle is equal to 24 units. Find x :



Your turn

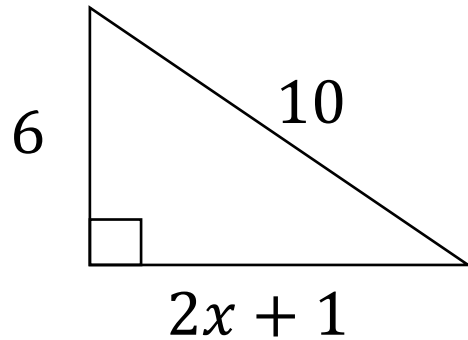
The area of the triangle is equal to 12 units. Find x :



$$x = \frac{10}{3}$$

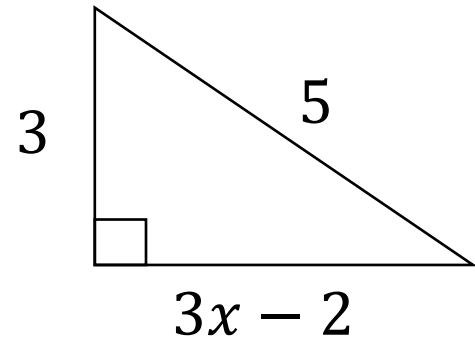
Worked example

The perimeter of the triangle is equal to 24 units. Find x :



Your turn

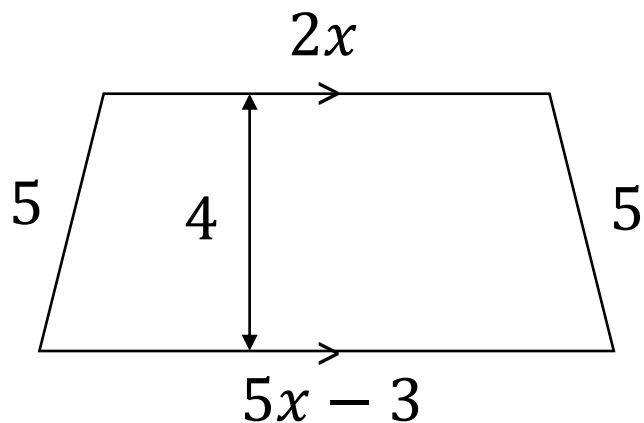
The perimeter of the triangle is equal to 12 units. Find x :



$$x = 2$$

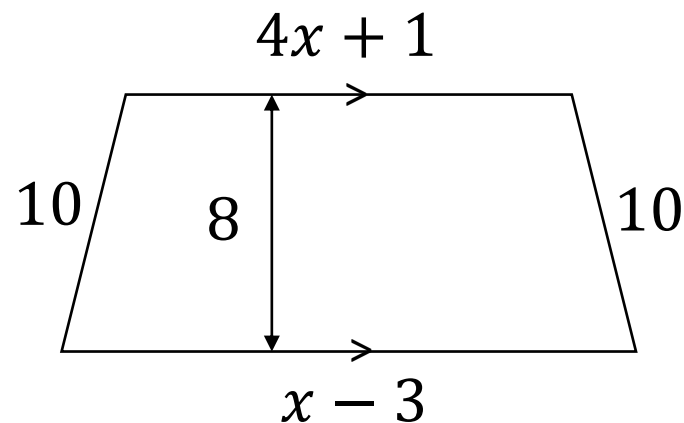
Worked example

The area of the trapezium is equal to 36 square units. Find x :



Your turn

The area of the trapezium is equal to 72 square units. Find x :



$$x = 4$$