

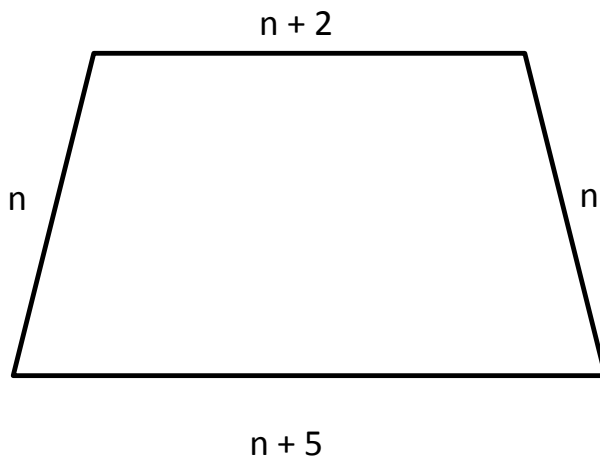


MATHS HOMEWORK = HELP

## Algebra - Calculator

1) The diagram shows a trapezium.

The side lengths are in centimetres.



Not drawn accurately

a) When  $n = 6$ , what is the perimeter of the trapezium?

b) When the perimeter of the trapezium is 35cm, what is the value of  $n$ ?

2) Look at these simultaneous equations

$$2a + 3b = 21$$

$$3a - 2b = -1$$

a) Find the value of a and b

b) Find the value of  $4a - 3b$

3) Look at this equation

$$a - 2 = b + 7$$

a) Which of a and b is greater, and by how much?

b) Look at this equation

$$6 - c = 9 - d$$

Which of  $c$  and  $d$  is greater, and by how much?

4) a) The perimeter of a regular pentagon is  $25a + 40$

Write an expression for the length of one of its sides

b) The perimeter of a regular polygon is  $16b - 36$ .

The length of one of its sides is  $4b - 9$ .

How many sides does this regular polygon have?

c) The perimeter of a triangle is  $3(2c - 5)$

Find the perimeter of the square when  $c = 20$

5) Write the missing numbers

$$8x - 3 = 29$$

So  $8x - 2 =$

$$5 - 3y = 12$$

So  $2(5 - 3y) =$

6) a) Here are two equations

$$h = c + d$$

$$c + d + h = 24$$

What is the value of h?

b) Look at this information

$$7 = c + d$$

c is one more than d

What is the value of c?

7) a) Jessica multiplies out the brackets in the expression  $5(3x - 2)$

She writes  $5(3x - 2) = 15x - 2$

Show why Jessica is wrong.

b) Aidan multiplies out the brackets in the expression  $(x + 5)(x + 3)$

He writes  $(x + 5)(x + 3) = x^2 + 15$

Show why Aidan is wrong.

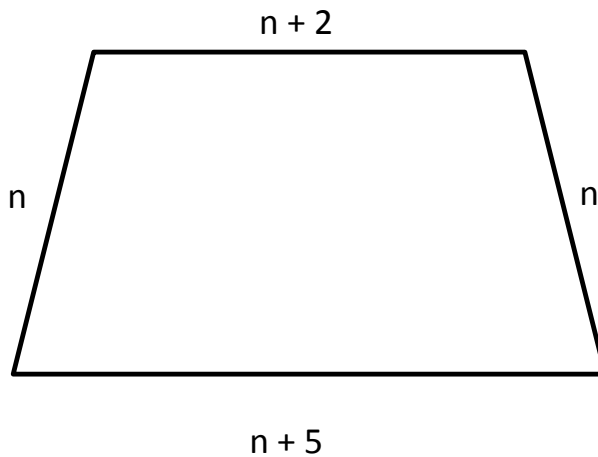


MATHS HOMEWORK = HELP

## Answers

1) The diagram shows a trapezium.

The side lengths are in centimetres.



Not drawn accurately

a) When  $n = 6$ , what is the perimeter of the trapezium?

$$6 + 6 + 2 + 6 + 6 + 5 = 31\text{cm}$$

b) When the perimeter of the trapezium is 35cm, what is the value of  $n$ ?

$$n + n + 2 + n + n + 5 = 35$$

$$4n + 7 = 35$$

$$4n = 28$$

$$n = 7\text{cm}$$

2) Look at these simultaneous equations

$$2a + 3b = 21 \quad (1)$$

$$3a - 2b = -1 \quad (2)$$

a) Find the value of a and b

$$(1) \times 2 \qquad 4a + 6b = 42$$

$$(2) \times 3 \qquad 9a - 6b = -3$$

$$(1) + (2) \qquad 13a = 39$$

$$a = 3$$

$$\text{substitute into (1)} \qquad 6 + 3b = 21$$

$$3b = 15$$

$$b = 5$$

b) Find the value of  $4a - 3b$

$$(4 \times 3) - (3 \times 5) = 12 - 15 = -3$$

3) Look at this equation

$$a - 2 = b + 7$$

a) Which of a and b is greater, and by how much?

$$a = b + 7 + 2$$

$$a = b + 9$$

a is greater by 9

b) Look at this equation

$$6 - c = 9 - d$$

Which of c and d is greater, and by how much?

$$6 + d = 9 + c$$

$$d = 9 + c - 6$$

$$d = c + 3$$

d is greater by 3

4) a) The perimeter of a regular pentagon is  $25a + 40$

Write an expression for the length of one of its sides

$$(25a + 40) \div 5 = 5a + 8$$

b) The perimeter of a regular polygon is  $16b - 36$ .

The length of one of its sides is  $4b - 9$ .

How many sides does this regular polygon have?

$$(16b - 36) \div (4b - 9) = 4 \text{ sides}$$

c) The perimeter of a triangle is  $3(2c - 5)$

Find the perimeter of the square when  $c = 20$

$$\text{One side of the triangle is } 3(2c - 5) \div 3 = 2c - 5$$

$$\text{Therefore the perimeter of the square is } 4 \times (2c - 5) = 8c - 20$$

$$\text{If } c = 20, \text{ then the perimeter is } (8 \times 20) - 20 = 160 - 20 = 140$$



5) Write the missing numbers

$$8x - 3 = 29$$

So  $8x - 2 = 30$

$$5 - 3y = 12$$

So  $2(5 - 3y) = 24$

6) a) Here are two equations

$$h = c + d$$

$$c + d + h = 24$$

What is the value of h?

$c + d + h = 24$       Therefore  $h + h = 24$

$$2h = 24$$

$$h = 12$$

b) Look at this information

$$7 = c + d$$

c is one more than d

What is the value of c?

$d = c - 1$       Therefore  $7 = c + c - 1$

$$7 = 2c - 1$$

$$8 = 2c$$

$$c = 4$$

7) a) Jessica multiplies out the brackets in the expression  $5(3x - 2)$

She writes  $5(3x - 2) = 15x - 2$

Show why Jessica is wrong.

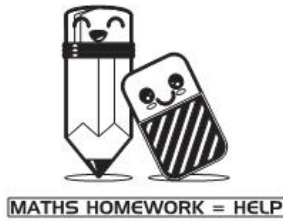
$$5(3x - 2) = 15x - 10$$

b) Aidan multiplies out the brackets in the expression  $(x + 5)(x + 3)$

He writes  $(x + 5)(x + 3) = x^2 + 15$

Show why Aidan is wrong.

$$(x + 5)(x + 3) = x^2 + 5x + 3x + 15 = x^2 + 8x + 15$$



## **Tips and Techniques**

1. Read each question slowly. You may find it helpful to underline the numbers and important information that will affect your answer.

*For example: Find 23 more than 57?*

2. If you do not understand the question straightaway, try reading it through a couple of times until it makes sense.

3. Make sure you read the question carefully. Often, the words highlighted in bold in the question will be the part you need to pay the most attention to, e.g. *Which country had the **greatest increase** in visitors from 2005 to 2006?*

4. Even if you know the answer to the question without working it out on paper, it is important to always show your working out in the box provided. You will lose marks if you do not do this.

5. Always use a ruler when drawing shapes, symmetry or graphs.

6. Topics that are useful to revise;

\* **Time** - 24 hour clock, adding a length of time e.g. 45 minutes to a certain time. An example of a question where time is used is - *"The time is one thirty in the afternoon. Write this as it would be shown on a twenty-four hour clock?"*

\* **Money** - find the total amount of shopping items, how much change will you get from a £5, £10 note etc.

\* **Number calculations** - times tables, addition, subtraction, multiplication and division methods.

\* **Measurement** - how many metres in a kilometre, millilitres in a litre and grams in a kilogram?

\* **Percentages and fractions** -  $1/2=0.5$  or 50%,  $1/4=0.25$  or 25%,  $3/4=0.75$  or 75%,  $1/3=0.33$  or 33%,  $1/5=0.2$  or 20%

7. Check to see how many marks the question is worth. If it is worth more than one mark, make sure you show your working out.

8. Use everyday objects to help your child practice certain topics. For example; a shopping receipt can be good revision for money questions - adding totals and finding change. Other useful objects that you could use are;

\* **Television Guide** - Practice the time a programme starts, what time will it finish? how long does the programme last?

\* **Weather Chart** - Change in temperature - e.g. *The temperature fell from 3 degrees celsius to -4 degrees celsius. By how many degrees did the temperature fall?*

\* **Measure yourself and other family members to practice height** (in cm, metres), weight (in grams, kilograms), area of hands and feet. You could also calculate the average family height, weight etc.