

1

Maria bakes cakes and sells them in bags.

[2016S]



She uses this formula to work out how much to charge for one bag of cakes.

$$\text{Cost} = \text{number of cakes} \times 20\text{p} + 15\text{p for the bag}$$

How much will a bag of 12 cakes cost?

£

Olivia buys a bag of cakes for £5.15

Use the formula to calculate how many cakes are in the bag.

Show your method

--

[3 marks]

2

Here is the rule that an electrician uses to work out how much to charge a customer.

[Extra]

$$\text{Cost in pounds} = 25 \times \text{hours worked} + 55$$

The electrician takes **three hours** to replace some electrical cable and some sockets.

Use the rule to work out how much the electrician should charge the customer.

£

[2 marks]

3

Here is a rule for the time it takes to cook a chicken.

[2017]

**Cooking time = 20 minutes plus an extra
40 minutes for each kilogram**

How many minutes will it take to cook a 3 kg chicken?

minutes

What is the mass of a chicken that takes 100 minutes to cook?

kg

[2 marks]

4

[2001]

Boat Hire	
Motor boats £1.50 for 15 minutes	Rowing boats £2.50 for 1 hour

How much does it cost to hire a **rowing boat** for three hours?



Sasha pays **£3.00** to hire a **motor boat**.

She goes out at **3:20 pm**.

By what time must she **return**?



[2 marks]

5

[Extra]

Here is a rule to work out the time it takes to cook a piece of meat.

$$\text{Time in minutes} = 35 \times \text{weight in kg} + 30$$

A piece of meat has a weight of 4 kg.

Use the rule to work out the time, in minutes, it takes to cook this piece of meat.

[2 marks]

6

The cost of food for a wedding is £300 plus £9 per person.

[Extra]

This rule written as a formula is

$$C = 300 + 9 \times n$$

Explain what the letter **n** represents in the formula.

.....

.....

A couple want food for **200** guests.

How much will it cost them?

£

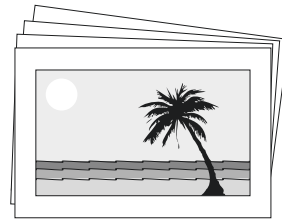
[2 marks]

7

Alfie has some photographs printed.

[Extra]

The cost is £2.50 for postage and 12 pence for each print.



Alfie uses this formula for the total cost (C) in pence.

$$C = 250 + 12n$$

n stands for the number of photographs.

The total cost for Alfie is **£6.70**

How many photographs does he have printed?

Show your method

--

[2 marks]

8

The following formula is used to convert a temperature in degrees Celsius ($^{\circ}\text{C}$) to a temperature in degrees Fahrenheit ($^{\circ}\text{F}$).

$$F = 1.8 \times C + 32$$

Use the formula to convert a temperature of 20 degrees Celsius to degrees Fahrenheit.

Show your method

[2 marks]

9

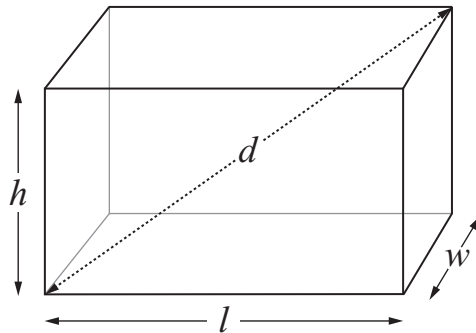
A cuboid has length, l , width, w , and height, h

[Extra]

The distance between opposite corners is d

Look at the formula.

$$d^2 = l^2 + w^2 + h^2$$



Use the formula to find the value of d when $l = 6$, $w = 2$ and $h = 3$

Show your method

[2 marks]

10

[Extra]

The cost to hire a boat on a lake is worked out using the information below.

Cost to hire a boat:

£4.50 per boat

and then

£3.50 per hour



Four friends hire a boat for five hours.

They share the cost equally.

How much does **each** person pay?

£

Chen's family hires a boat and pays a total of £15

How many hours did they have the boat for?

hours

[2 marks]

11

[Extra]

Doctors sometimes use this formula to calculate how much medicine to give a child.

$$c = \frac{ay}{12 + y}$$

c is the correct amount for a child, in ml

a is the amount for an adult, in ml

y is the age of the child, in years

A child who is **4 years old** needs some medicine.

The amount for an adult is **20ml**.

Use the formula to work out the correct amount for this child.

Another child needs some medicine.

The amount for an adult is **30ml**.

The correct amount for this child is **15ml**.

How old is this child?

Show your method

[4 marks]

12

[Extra]

Some people use this rule to work out how many hours' sleep each night young children need.

Subtract the child's age in years **from 30**,
then **divide** the result by **2**

Sanjay is **8** years old.

Use the rule to work out how many hours' sleep he needs.



_____ hours

Lisa is **6** years old.

She wakes up every morning at **7am**.

Use the rule to work out what time she needs to go to sleep.

Show your method

A large grid for showing the method. The grid is 20 units wide and 10 units high. A small empty rectangular box is drawn on the grid, approximately 4 units wide and 2 units high, located in the lower right quadrant.

[3 marks]

14

To find the n th triangular number, you can use this rule.

[Extra]

$$n\text{th triangular number} = \frac{n}{2}(n + 1)$$

$$\begin{aligned}\text{Example: 3rd triangular number} &= \frac{3}{2}(3 + 1) \\ &= 6\end{aligned}$$

Work out the **10th** triangular number.



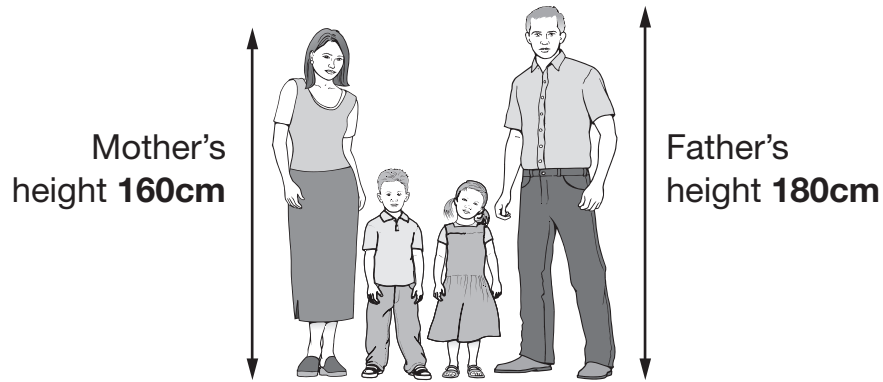
Now work out the **100th** triangular number.



[2 marks]

Here are Alfie and Emma with their parents.

[Extra]



You can use the table below to predict how tall children will be when they are adults.

There is one formula for boys and a different one for girls:

Boy's predicted height	Girl's predicted height
$0.4(x + y) + 42$	$0.4(x + y) + 29$
x is the father's height in cm. y is the mother's height in cm.	

Calculate the predicted height of Alfie when he is an adult.


 cm

When Emma is an adult, she is predicted to be taller than her mother.

How much taller?


 cm

[2 marks]