

ALGEBRA Challenge 2

Can You Solve This?

$$\text{Red Flower} + \text{Red Flower} + \text{Red Flower} = 60$$

$$\text{Red Flower} + \text{Blue Flower} + \text{Blue Flower} = 30$$

$$\text{Blue Flower} - \text{Yellow Flower} = 3$$

$$\text{Yellow Flower} + \text{Red Flower} \times \text{Blue Flower} = ?$$

Super Shapes

Each of the following shapes has a value:

$$\triangle = 7 \quad \square = 17$$

The value of the red shapes changes in each of the following problems. Can you discover its value in each problem, if the values of the shapes are being added together?

(a) $\triangle + \text{red circle} + \square = 25$

(b) $\square + \triangle + \triangle + \text{red oval} = 51$

(c) $\triangle + \triangle + \text{red pentagon} + \text{red pentagon} + \square + \square = 136$

(d) $\text{red triangle} + \text{red triangle} + \text{red triangle} = 48$

(e) $\triangle + \text{red oval} + \triangle + \square + \triangle + \text{red oval} + \triangle = 100$

TIP

First, put in the information that you know.

Check by putting your answers into your equations?

Check [rich.plentyofpens](http://rich.plentyofpens.com) - solutions

Plenty of Pens

Amy went into her local stationery shop. Her mum had given her £2.50 to spend.

Amy liked the look of some luminous pens, which cost 15p each, and some fancy pencils, which cost 10p each.



She bought four times as many pens as pencils and was given 40p change.

How many of each did she buy?

Check by putting your answers into your equations?

Check rich.super.shapes- solutions

TIP:
How much money did she actually spend?

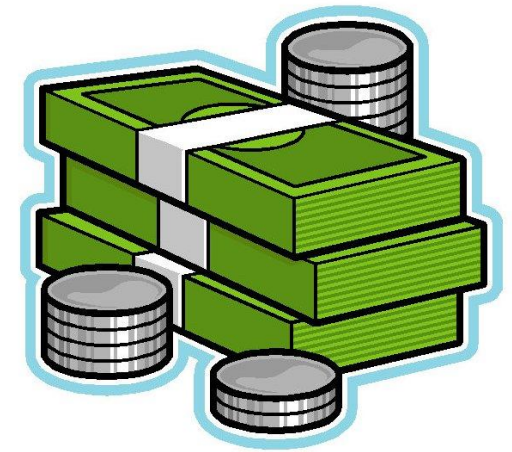
How many unknowns are there?

How many equations can you make?

Will there be more pens or pencils?

Can you express the quantity of pens in pencils?

How much money?



Harris and Kim have £20 in total.

Harris and Zack have £13 in total.

Kim and Zack have £15 in total.

How much money does each person have?

TIP: How many equations can you make? Can you express one amount in terms of another?

H = Harris money K = Kim's money

H + K = 20 so

e.g. H = 20 - K (Kim's money)

Can you already tell which one will have more money?

A bar model can help you here.

Answer next slide.

How much money? -

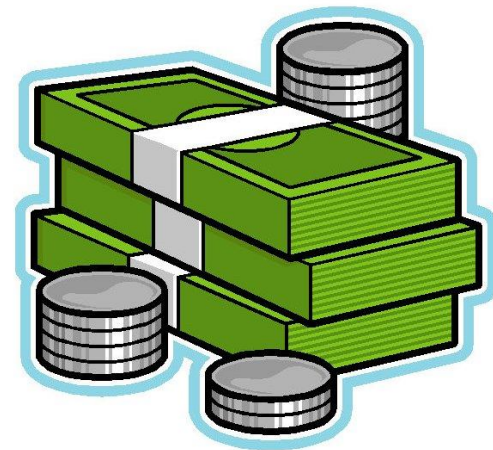
Answer:

Task A: Harris has £9, Kim has £11, Zack has £4

H	$K = 20 - H$	= £ 20
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H	$Z = 13 - H$	= £ 13
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$K = 20 - H$	$Z = 13 - H$	= £ 15
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How heavy are they?



Ben and Sam weigh 90kg in total.

Jack and Ben weigh 100kg in total.

Sam and Jack weigh 80kg in total.

How much does each person weigh?

TIP: How many equations can you make? Can you express one amount in terms of another?

Use a bar model to help you: which one will be the heaviest? Which one will be the lightest?

Answer next slide.

How heavy are they? -

Answer:



Task B: Ben is 55kg, Jack is 45kg, Sam is 35kg



= £ 90



= £ 100



= £ 80



Hmmmm....



Julie and Steph weigh 80kg in total.

Alice and Julie weigh 80kg in total.

Agree or disagree:

'Alice, Julie and Steph must all weigh 40kg.'

Explain your answer!



Hmmmm....



Julie and Steph weigh 80kg in total.

Alice and Julie weigh 80kg in total.

Agree or disagree:

'Alice, Julie and Steph must all weigh 40kg.'

Answer: Steph and Alice must weigh the same: when weighed with Julie, the combined weights are the same (80kg). However, Julie may be lighter or heavier than 40kg (e.g. she may weigh 45kg and Steph and Alice could each weigh 35kg).

Letter Land

Age 11 to 14 ★

If

$$A + C = A$$

$$F \times D = F$$

$$B - G = G$$

$$A + H = E$$

$$B/H = G$$

$$E - G = F$$

and $A-H$ represent the numbers from 0 to 7

Find the values of A, B, C, D, E, F, G and H .



Check your answers: Put the numbers you have worked out into the equation.

Check your answers:

<https://nrich.maths.org/letterland> - solution

Not a Polite Question

Age 11 to 14 Short ★★

When asked how old she was, the teacher replied:

My age in years is not prime but odd
and when reversed and added to my age
you have a perfect square.

Or you can reverse and subtract, and
again you have a perfect square.

Check your answers:

[https://nrich.maths.org/not a polite question](https://nrich.maths.org/not_a_polite_question) - solution

Finished? Well down.

Have answered all the extensions from the previous week (Nrich)?

