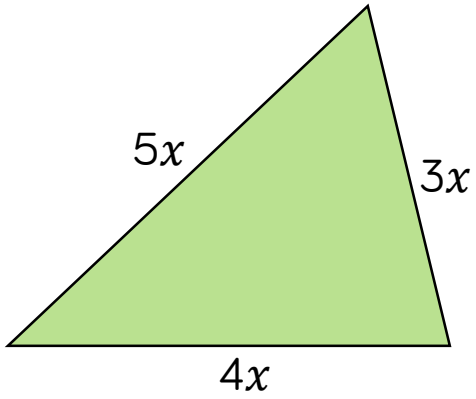
One-step Equations

Reasoning and Problem Solving

The perimeter of the triangle is 216 cm.



Form an equation to show this information.

Solve the equation to find the value of x.

Work out the lengths of the sides of the triangle.

$3x + 4x + 5x = 216$

$12x = 216$

$x = 18$

$5 \times 18 = 90$

$3 \times 18 = 54$

$4 \times 18 = 72$

- Hannah is 8 years old
- Jack is 13 years old
- Grandma is $x + 12$ years old.
- The sum of their ages is 100

Form and solve an equation to work out how old Grandma is.

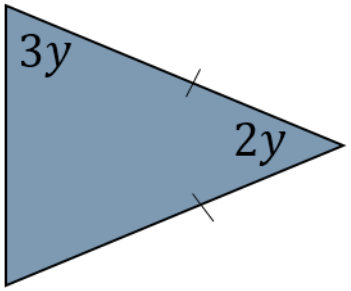
$8 + 13 + x + 12 = 100$

$33 + x = 100$

$x = 77$

Grandma is 77 years old.

What is the size of the smallest angle in this isosceles triangle?



How can you check your answer?

$8y = 180$

$y = 22.5$

Smallest angle = 45°

Check by working them all out and see if they add to 180°

Two-step Equations

Reasoning and Problem Solving

The length of a rectangle is $2x + 3$
The width of the same rectangle is $x - 2$
The perimeter is 17 cm.

Find the area of the rectangle.

$6x + 2 = 17$
$6x = 15$
$x = 2.5$
Length = 8 cm
Width = 0.5 cm
Area = 4 cm^2

Alex has some algebra expression cards.

$y + 4$

$2y$

$3y - 1$

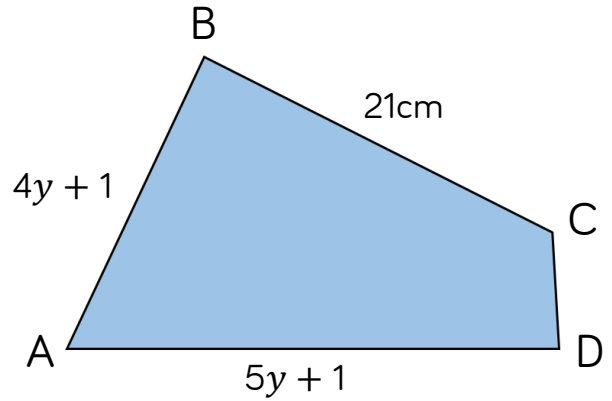
The mean of the cards is 19
Work out the value of each card.

$6y + 3 = 57$
$6y = 54$
$y = 9$

Card values:
13
18
26

Here is the quadrilateral ABCD.

The perimeter of the quadrilateral is 80 cm.



AB is the same length as BC.

Find the length of CD.

$4y + 1 = 21$
$4y = 20$
$y = 5$

AB = 21 cm
BC = 21 cm
AD = 26 cm
CD = 80 – (21 + 21 + 26) = 12 cm

Find Pairs of Values (1)

Reasoning and Problem Solving

a, b and c are integers between 0 and 5

$$a + b = 6$$
$$b + c = 4$$

Find the values of a, b and c

How many different possibilities can you find?

Possible answers:

$a = 4 \quad b = 2$
$c = 2$

$a = 3 \quad b = 3$
$c = 1$

$a = 2 \quad b = 4$
$c = 0$

x and y are both positive whole numbers.

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

Dora says,

x will always be a multiple of 4

Jack says,

y will always be a factor of 4

Only one is correct – who is it?
Explain your answer.

Possible answer:

Dora is correct as x will always have to divide into 4 equal parts e.g. $32 \div 8 = 4$, $16 \div 4 = 4$

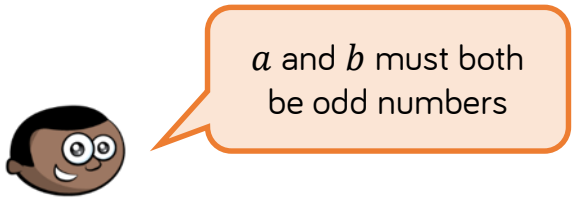
Jack is incorrect. $40 \div 10 = 4$ and 10 is not a factor of 4

Find Pairs of Values (2)

Reasoning and Problem Solving

$ab + b = 18$

Mo says,



Is Mo correct?
Explain your answer.

Possible answer:

Mo is incorrect. Children may give examples to prove Mo is correct e.g. if $a = 5$ and $b = 3$, but there are also examples to show he is incorrect e.g. $a = 2$ and $b = 6$ where a and b are both even.

Large beads cost 5p and small beads cost 4p

Rosie has 79p to spend on beads.

4p 5p

How many different combinations of small and large beads can Rosie buy?

Can you write expressions that show all the solutions?

Possible answers:

$3l + 16s$
$7l + 11s$
$11l + 6s$
$15l + s$