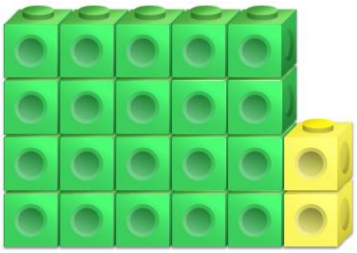
Problem of the Week: Week 1 (Summer 2): Year 8: Algebra: Arithmetic sequences and simple factorising

- Recognise arithmetic sequences and find the nth term
- Simplify and manipulate algebraic expressions by taking out common factors
- Solve linear equations, including factorising

Problem

This picture shows the 5th term of a pattern made with cubes to represent the sequence 4n + 2.



- What in the picture shows that it's the 5th term?
- What in the picture shows that 4n is a part of the rule for the sequence?
- What in the picture shows that +2 is a part of the rule for the sequence?
- Describe the arrangement of cubes for the 24th term
- How many cubes would be in the 24th pattern?

https://www.ncetm.org.uk/resources/47230 (secondary assessment materials)

Problem

The simple life

Which is the odd one out?

1. $(3x+4y)+2(x+2y)$
2. $4(2x+5y)-3(x+4y)$
3. $3(2x+3y)-(x-y)$
4. $3(x+3y)+(2x-y)$

Now combine pairs of expressions to get $5x+8y$. The only expressions that you are allowed to use are:

$(x+y)$ $(x+2y)$ $(x-2y)$ $(x+4y)$ $(2x+3y)$

You can pick any two of these expressions and add or subtract multiples of each.
How many solutions can you find?

https://nrich.maths.org/13207

Problem

Pete is solving a linear equation. He draws this bar model to help.

t	t	t	7
t	t	10	

- What equation is Pete solving?
- What is the value of t?
- How do you know what the value of t is?

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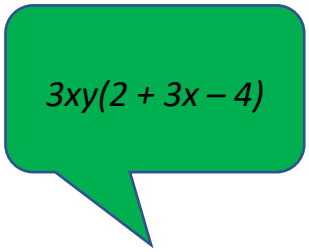
Problem

Tom says, when you factorise the expression ***6xy + 3x – 12xy***, the answer is:



Is Tom right?
Give reasons for your answer