Problem of the Week: Week 3 (Sum1): Year 9: Proportion: Direct and inverse

• Solve problems involving direct and inverse proportion, including graphical and algebraic representations

Toad in the hole

Suppose you can buy Toad in the Hole for one person from a supermarket for £1.

Would it be cheaper to make it yourself if you want to feed a family of three?

Shopping list:

- 400g sausages, £2
- 1 litre vegetable oil, £1.45
- 500g plain flour, 48p
- 6 eggs, £1.46
- 1 litre milk, 48p

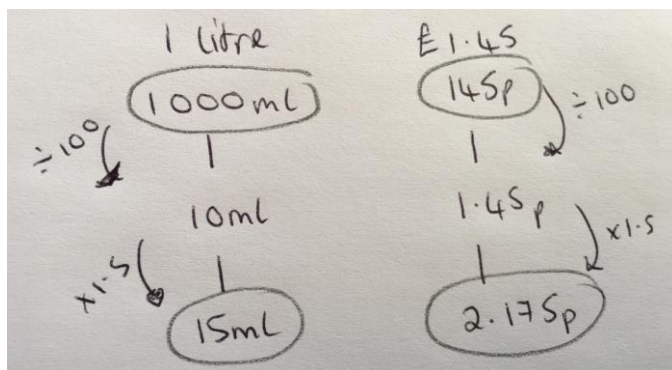Ingredients required to make Toad in the Hole for three people:

- 400g sausages
- 15ml vegetable oil
- 100g plain flour
- 1 egg
- 250ml milk

Toad in the Hole is a traditional English dish, consisting of sausages in a batter, and served with gravy.

https://nrich.maths.org/8422

Try using four corners approach to find the cost for the ingredients for 3 people:

e.g. for vegetable oil

Once you are confident with this method look at the following four questions and students' answers to see if you can spot the error and correct the mistakes:

RECIPE

Pancake mix

For 4 pancakes you will need:

6 dessertspoons of flour

$\frac{1}{4}$ litre milk

1 pinch salt

1 egg

You want to make 10 pancakes.

1. How much flour do you need?
2. How much milk do you need?

① 10 pancakes = 6 + 6 + 3 = 15 spoons of flour

② = $\frac{1}{4} + \frac{1}{4} + \frac{1}{8}$ = $\frac{3}{16}$ pints of milk.

PAINT PRICES

Calculate the missing prices of the paint cans below.
The prices are proportional to the amount of paint in the can.

£ ... £ ... £15 £ ... £ ...

PAINT PAINT PAINT PAINT PAINT

0.6 litres   0.75 litres   1 litre   2.5 litres   4.54 litres (1 gallon)
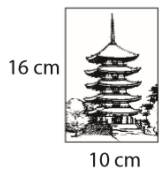
1. 0.6 litres   15 ÷ 0.6 = 25p

2. 0.75 litres = $\frac{1}{2} + \frac{1}{4}$

= £7.50 + £3.75 = £11.25

3. 2.5 litres = 2 + $\frac{1}{2}$

= £30 + £7.50 = £37.50

4. 4.54 litres = 15 × 4.54

= 68.1

ENLARGING A PHOTOGRAPH TO MAKE A POSTER

Photograph

Poster

16 cm

10 cm

?

25 cm

1. The photograph is enlarged to make a poster.
    The photograph is 10 cm wide and 16 cm high.
    The poster is 25 cm wide.
    How high is the poster?

2. In the poster, the building is 30 cm tall.
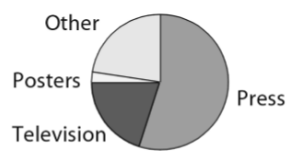   How tall is it in the photograph?

The poster is 15 cm bigger

(1.) 16 + 15 = 31 cm high.

(2) 30 - 15 = 15 cm high.

ADVERTISING

	% spent	Angle in pie chart
Press	55	
Television	20	72°
Posters		9°
Other		

Other

Posters

Television

Press

The pie chart shows the proportion spent on advertising in different media in one year.

Calculate the missing entries in the table.

20% → 72°
10% → 36°
5% → 18°

Press = 72° + 72° + 36° + 18° → 198°
Posters = 9° → 2·5%
Other = 100 - 77·5 = 22·5%
= 20% + 2·5%
→ 72° + 9° = 81°

55
20 +
2·5
‾‾‾‾
77·5

Standards Unit Box N6