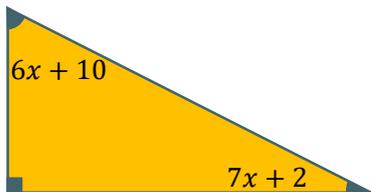# Here are 5 Christmas problems to solve!

1

Angels in the Cheese

Matthew wants to work out the angles in his wedge of Christmas cheese. The diagram shows the angles in degrees.

$6x + 10$

$7x + 2$

Work out the size of the smallest angle of the cheese.

2

Number of Presents

Lin is analysing the number of presents he gets at Christmas per year. He received 6.25% more presents in 2015 than 2014. In 2015 he received 34 presents.

He assumes his present number will continue to increase at a constant rate of 6.25% each year.

a) Use Lin's model to estimate the number of presents he will receive on Christmas day 2017.

b) i) Use the model to estimate which year will be the first year he receives more than 45 presents.

b) ii) If his assumption is too high, how will this affect your answer to (b) (i)?

3

Driving Home for Christmas

Taylor drives back to her mum's house for Christmas.
She drives at an average speed of 50 mph for the first
2 hours 30 minutes of the journey.
Taylor stops for half an hour and realizes she still has 150 miles left to travel.
Taylor increases her average speed to 60 mph for the remaining 150 miles.

Taylor's mum says: "Your average speed for the whole journey was 55 mph".
Is she correct? Show how you get your answer.

5

Biased Monopoly

The Smiths are playing Monopoly on Christmas day. James notices the die is biased! The table shows the outcomes of each roll of the die for each of them.

a) Whose results will give the best estimate for the probability of rolling a 1? Justify your answer.

4

Christmas Puddings

Below is a list of ingredients to make a Christmas pudding big enough for 2 people.

$1\ egg$
$25g\ self\ raising\ flour$
$55g\ breadcrumbs$
$1\ teaspoon\ of\ mixed\ spices$

a) Tina has $60g$ of self raising flour and $110g$ of bread. Assuming she has plenty of eggs and spices, work out the greatest whole number of people she can make Christmas pudding for.

b) She realizes she only has 3 eggs. How does this affect the number of people she can make Christmas pudding for?

	1	2	3	4	5	6
Kerry	20	9	10	8	8	11
Alex	18	5	7	6	1	5
James	30	7	8	7	5	15
Ann	20	7	5	8	9	11

b) James says "You are twice as likely to roll a 1 than a 6". Is he correct?

c) Estimate the probability the next two rolls will land a 1.