



Innovators in  
Mathematics  
Education

## MEI Diagnostic Tool

The purpose of this mathematical diagnostic tool is to promote a dialogue between employers and MEI that will consider the sorts of mathematical skills that are valuable to people in employment. This will help MEI to relate its own expertise in school mathematics provision to employment needs.

You are invited to consider the following questions, perhaps in groups, considering in each case how critical it is that people in your workplace can answer the question. In each case please tick the relevant box to indicate that:

- a) it is critically important that our people can get the right answer
- b) it is valuable if our people can get the right answer
- c) it doesn't matter whether our people can get the right answer

We provide a space below each question for you to add any other comments that occur to you. If there is a related skill that does matter to you, please say what this is in the space for comments.

1. Find 5% of £3million

a)	b)	c)
Comment		

2. A measurement is given as  $3\text{m} \pm 0.2\%$ . What range of values could the correct length be?

a)	b)	c)
Comment		

3. A distiller bottles single malt whisky in 750 ml bottles. How much whisky is there in 4 cases of 12 bottles each? What if there are 400 cases?

What units would you expect the answer to be given in?

a)	b)	c)
Comment		

4. A nurse gives a hospital patient a drug at a drip rate of 2.5 ml per minute, using a 1000ml drip. The drip is started at 9am. At what time will all the drug have been administered?

a)	b)	c)
Comment		

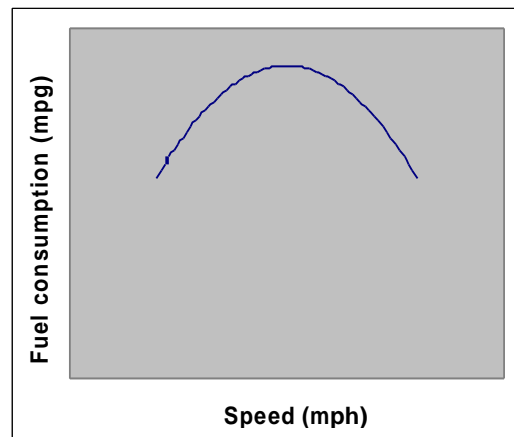
5. The graph shows the fuel consumption of a car at typical driving speeds. The fuel consumption is modelled by

$$c = \frac{1}{40}(100v - v^2)$$

where  $v$  stands for the speed of the car

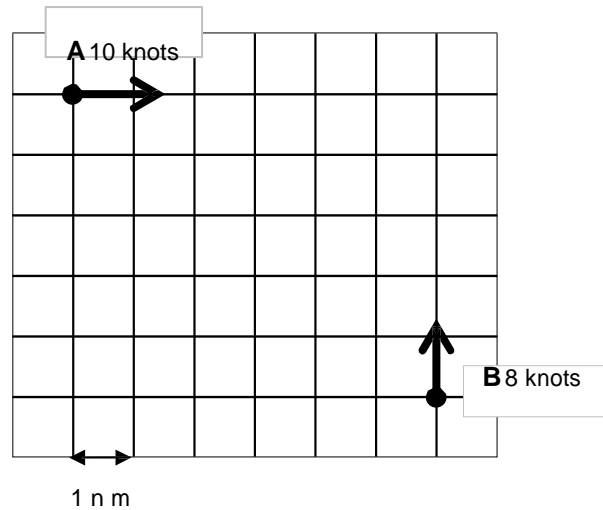
What does the graph tell you about the optimum fuel consumption?

What are the limitations of the model?



a)	b)	c)
Comment		

6. The diagram shows the positions of two ships at a certain time. The ships are moving as shown. Will they collide if they continue on their present courses?



a)	b)	c)
Comment		

7. The table shows the number of farms reporting foot and mouth disease at the start of the outbreak in 2001.

**Foot and Mouth Outbreak 2001**

Date	Number of farms
22-Feb	3
23-Feb	5
24-Feb	6
25-Feb	7
26-Feb	12
27-Feb	17
28-Feb	24
1-Mar	31
2-Mar	40
3-Mar	51
4-Mar	69
5-Mar	74
6-Mar	76

A researcher suggests the number of farms is growing exponentially. Is he right?

a)	b)	c)
Comment		

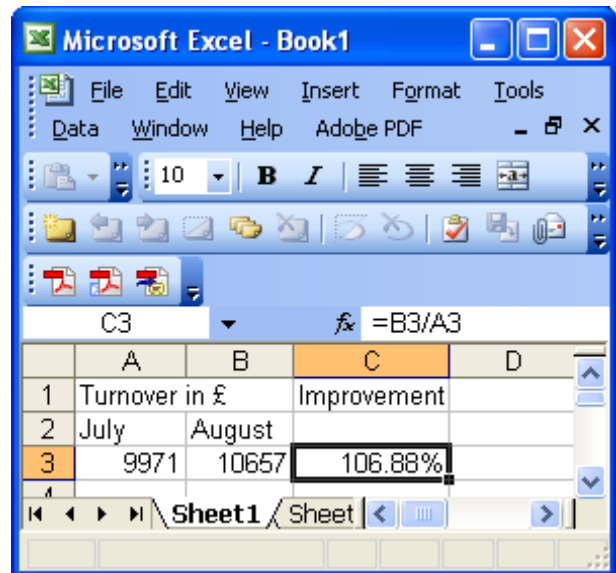
8. A spreadsheet is used to calculate the percentage increase in turnover between July and August.

The July turnover was £9971, and the August turnover was £10657.

The formula in cell C3 divides the August turnover by the July turnover and formats the result as a percentage. The output is 106.88%.

This is not the required percentage increase.

What formula should have been put in cell C3?



a)	b)	c)
Comment		

9. Think of a context in your company in which it is relevant to calculate:

$$5\frac{1}{3} \times 1\frac{3}{4}$$

Consider whether you would prefer the answer:

- as a fraction
- in the form given by a calculator
- as an approximation

a)	b)	c)
Comment		