

**Q1.** The value of a vintage car rises from £36 000 to £63 000.

Work out the percentage increase in the price of the car.

.....  
.....  
.....

Answer .....%

**(Total 3 marks)**

**Q2.** The usual cost of hiring a holiday cottage is £460.  
In July the cost increases to £700.

Calculate the percentage increase in the cost.

.....  
.....  
.....  
.....

Answer .....%

**(Total 3 marks)**

**Q3.** (a) Three friends share a pizza.  
One eighth of it falls on the floor and is thrown away.  
The remainder is shared equally.

What fraction of the whole pizza does each person get?

.....  
.....  
.....

Answer .....

**(3)**

- (b) The pizza costs £6.40  
This is 20% less than the original price.

What was the original price of the pizza?

.....  
.....  
.....

Answer £ .....

(3)  
(Total 6 marks)

- Q4.** A special packet of breakfast cereal contains 20% more than a normal packet. The special packet contains 600 g of cereal. How much cereal does the normal packet contain?

.....  
.....  
.....  
.....

Answer ..... g

(Total 3 marks)

- Q5.** Sam sees this sign in a shop window.

<p style="text-align: center;"><b>PRICE REDUCTION PHONES 45% OFF NOW £31.90</b></p>	
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How much was the phone before the price reduction?

.....  
.....  
.....  
.....  
.....  
.....

Answer £ .....

**(Total 3 marks)**

**Q6.** James invests £700 for 2 years at 10% per year compound interest.  
How much interest does he earn?

.....  
.....  
.....  
.....

Answer £ .....

**(Total 2 marks)**

**Q7.** £4500 is invested at 3.2% compound interest per annum.  
How many years will it take for the investment to exceed £5000?

.....  
.....  
.....  
.....  
.....  
.....

Answer ..... years

**(Total 3 marks)**

**M1.** 
$$\frac{63(000) - 38(000)}{38(000)}$$

M1

× 100

*M2 complete and correct build up method. If any numerical errors calculations must be shown to give M2.*

M1dep

75

A1

[3]

**M2.** 
$$700 - 460 (= 240)$$
  

$$\frac{700}{460} \times 100$$

*M1 For correct build up to £699.20 and answer 52*

M1

$$\frac{\text{Their } 240}{460} \times 100$$

*Their* 
$$\frac{700}{460} \times 100 - 100 \text{ or } 152(.1739 \dots)$$

M1 dep

52(.1739 ...)

52.2

*3 marks for correct build up which convinces regarding missing 80 p*

A1

[3]

**M3.** (a) 
$$1 - \frac{1}{8} (= \frac{7}{8})$$
  
oe

M1

Their 
$$\frac{7}{8} \div 3$$

oe 
$$\frac{2\frac{1}{3}}{8} \text{ or } \frac{2.\dot{3}}{8} \text{ or } \frac{0.875}{3}$$

M1 dep

$$\frac{7}{24}$$

oe

A1

(b) Sight of 80% or 0.8 or 1.25 or  $\frac{10}{8}$

$$\frac{6.4(0)}{8} \times 10$$

oe

8(.00)

B1

M1

A1

[6]

**M4.** 120% → 600

1.2

$$600 \div 120 \times 100$$

$$600 \div 1.2$$

500

B1

M1

A1

[3]

**M5.** sight of 0.55 or 55

$$55\% = 31.9 \text{ M1}$$

$$31.90 \div 0.55$$

$$1\% = 0.58 \text{ A1}$$

58 (.00)

B1

M1

A1

[3]

**M6.**  $700 \times 1.1^2 - 700$   
 or  $700 \times 0.1$  or 70 or  $700 \times 1.1$  or 770  
 or  $700 \times 1.1^2$   
 or 847 or 140

M1

147(.00)

A1

[2]

**M7.** Sight of 1.032

B1

$4500 \times 1.032$  to any power  $> 1$

M1

4 years

*Must see correct values for 3 years (4945.97) and 4 years (5104.24 or 4945.97 and 158.27) Accuracy can be to nearest pound rounded or truncated. Accept 'nearly 4' or 'between 3 and 4' if 5104.24 seen.*

*Common misconception.*

*Year 1 = 4500 etc.. leading to 5 years loses this A mark.*

A1

[3]

**Alt**

Calculating interest and adding on for at least two years

M1

Correct values for at least two years

<i>Interest yr 1</i>	<i>144</i>
<i>Total end yr 1</i>	<i>4644</i>
<i>Interest yr 2</i>	<i>148.61 (148.608)</i>
<i>Total end yr 2</i>	<i>4792.61 (4792.608)</i>
<i>Interest yr 3</i>	<i>153.36 (153.363456)</i>
<i>Total end yr 3</i>	<i>4945.97 (4945.971456)</i>
<i>Interest yr 4</i>	<i>158.27 (158.2710866)</i>
<i>Total end yr 4</i>	<i>5104.24 (5104.242543)</i>

*Accuracy can be to nearest pound rounded or truncated.*

A1

4 years

*Must see correct values for 3 years (4945.97) and 4 years (5104.24 or 4945.97 and 158.27)*

*Accept 'nearly 4' or 'between 3 and 4' if 5104.24 seen. Common misconception.*

*Year 1 = 4500 etc.. leading to 5 years loses this A mark.*

A1

[3]

**E1.** Many candidates did not know how to deal with the figures involved, with many dividing by 63 000. Those who did know what to do were sometimes held up by their arithmetic which was unnecessarily lengthy at times. Able candidates could virtually write down the answer. Less able candidates were often trying build up which rarely were of sufficient detail (once the accuracy had gone astray) to gain even a single mark.

**E2.** Not surprisingly for Foundation candidates this grade C question was found to be difficult by many. However a large number did gain some credit by calculating the actual increase but then could not compute the percentage increase successfully.

Quite a few candidates appeared to be attempting to use some kind of build up method, such as 50% is 230 so 10% is 46 and 1% is 4.6. Whilst this type of approach is a useful non-calculator method, it is not an appropriate method here as candidates are expected to have and be able to use a calculator efficiently. As a consequence, the majority of candidates using this approach were unable to score full marks as only the very best of these were able to get to £699.20 and then explain the final 80 p. The trial and improvement method used by some candidates met with very limited success as, again, the two methods expected were  $\frac{700 - 460}{460} \times 100$ , or  $\frac{700}{460} \times 100 - 100$ , both of which lead straight to the correct answer. A number appeared not to know this topic, and either left the question blank or just played with the numbers. For example,  $700 + 460$  was seen on a number of occasions. Some had a correct fraction but failed to multiply by 100 or found 460 as a percentage of 700.

**E3.** In part (a) many candidates scored full marks on this question but too many found  $\frac{7}{8}$  and then either didn't do anything with it or could not divide it by 3.  $2\frac{1}{3}$  was a common wrong answer obtained from dividing 7, instead of the fraction, by 3.

### **Additional Examiner's Commentary**

Many candidates find reverse percentages demanding, frequently producing answers which are unrealistic, such as  $\text{£}6.40 \div 20\% = \text{£}0.32$ . Candidates are first required to realise that the  $\text{£}6.40$  represents only 80% of the original price. They could then determine that 20% of the original price must be  $\text{£}6.40 \div 4 = \text{£}1.60$ , from which they can calculate that the original price must be  $\text{£}6.40 + \text{£}1.60 = \text{£}8$ . More able candidates will calculate  $\text{£}6.40 \div 0.8 = \text{£}8$ .

**E4.** Correct answers to this question were infrequent. Predictable incorrect responses were £480 or £720 obtained by subtracting or adding 20% of £600. Candidates who appreciated the link between 120% and £600 could not always use this fact to make progress and those who could and showed the full method sometimes made errors in their calculation. Use of the decimal multiplier, 1.2, was not seen. Some candidates arrived at £500 by an inspection method.

**E5. Intermediate Tier**

Few correct methods were seen for this question. It was rare to see 55 or 0.55 and most divided 31.90 by 0.45 or added on 45% of £31.90. A few used trial and improvement but little success was seen with this approach.

**Higher Tier**

Candidates normally scored either 0 or 3 marks. This is a topic that is improving but far too many still calculate 45% of £31.90 and add this on. The use of the percentage multiplier is increasing and this approach almost always led to full marks.

**E6.** Most candidates used simple interest and gained one mark only. Of those who used compound interest, many failed to answer the question giving the answer £847.

**E7.** On the whole this question was well done. Many candidates worked out the yearly interest and added this on, then did the same for the next year and so on. Not surprisingly they found space limited. Few used the formula  $4500 \times 1.032^n$ . This question only covered 4 years but compound interest questions for periods of time of 10 or 20 years may well be asked in the future. In such a situation use of the multiplier will be the only viable approach. Marks were lost by not showing the value for 4 years, the candidates assuming that 'it's obvious'. Quite a few candidates used simple interest which also gave an answer of 4 years but scored no marks.



