Questions 48 and 49
Phoebe is given Ben’s eleven-digit mobile phone number, but when she looks later she cannot read the third, fourth and last digits because the paper is torn, as indicated here:

```
0 4 # # 4 3 4 7 1 4
```

**Question 48**
Phoebe’s friend Rosa thinks that Ben’s number starts with 0417 and ends in an odd digit.

If this is correct, how many different 11-digit phone numbers would Phoebe have to try to be certain of ringing Ben’s number?

A 4  
B 5  
C 9  
D 10  

**Question 49**
Phoebe thinks that Ben’s phone number starts with either 0417 or 0419 but cannot remember the last digit.

If this is correct, how many different 11-digit phone numbers would Phoebe have to try to be certain of ringing Ben’s number?

A 20  
B 18  
C 10  
D 9  

UNIT 20

Questions 50 – 54

Figure 1 gives an estimate of the size of the workforce required to build a pyramid that is 150 metres high and has a square base with 300 metre long sides (similar to the Great Pyramid of Giza built for the Egyptian Pharaoh Khufu about 2500 BC). In the figure, the number of workers needed for each 20 metres of building height is given.

For convenience, the building of the first 20 metres is referred to as Stage 1, the building of the next 20 metres is referred to as Stage 2, and so on.

In the figure, the construction is divided into two sets of tasks:

1. Quarrying (cutting) the blocks and other tasks.
2. Hauling the blocks (horizontally) from the quarry and lifting them (vertically) into place on the growing pyramid.

![Figure 1](image)

**Figure 1**

**Note:**
- Figure 1 is not drawn to scale;
- the pyramid has a square base and a square cross-section at each stage;
- the length of a side of the base of the pyramid is 300 metres and its height is 150 metres.
Question 50
From stage to stage, as the pyramid gets higher from the start to finish, there is always
A a decrease in the number of people needed for hauling and lifting.
B an increase in the number of people needed for hauling and lifting.
C a decrease in the number of people needed for quarrying and other tasks.
D an increase in the number of people needed for quarrying and other tasks.

Question 51
How many people were needed for hauling and lifting in the stage when the pyramid was increased in height from 40 to 60 metres?
A 12400  C 6810
B 11500  D 6770

Question 52
Compared with the number of people needed for quarrying and other tasks for Stage 1, the number needed for quarrying and other tasks for Stage 5 was closest to
A one fifth.  C one third.
B one quarter.  D one half.

Question 53
Of the following, the greatest difference between the number of people needed for hauling and lifting and the number of people needed for quarrying and other tasks occurs in
B Stage 5.  D Stage 8.

Question 54
For which stage is the value of the fraction below greatest?
\[
\frac{\text{number of people needed for hauling and lifting}}{\text{number of people needed for quarrying and other tasks}}
\]
A Stage 1  C Stage 5
B Stage 2  D Stage 8
A telephone company, *Phonewise*, offers three different mobile phone plans to customers.

- *Premium* plan customers pay a rental of $10 per month plus 20 cents per call;
- *Timewise* plan customers pay a rental of $20 per month plus 15 cents per call; and
- *Business* plan customers pay a rental of $30 per month plus 10 cents per call.

Abby draws some graphs, including Figure 1, to help her work out the cost for various plans.

![Figure 1](image-url)

**Figure 1**

**Note:**
- Total cost equals the rental cost plus the cost of the calls.

**Question 55**

The total cost per month for Premium plan customers who make 100 calls is

A  $10.  
B  $20.  
C  $25.  
D  $30.
Question 56
Which line in Figure 1 represents the Business plan?
A  Line 1  
B  Line 2  
C  Line 3  
D  None of these three lines represents the Business plan.

Question 57 refers to the following additional information:
Abby draws the graphs (I, II, III and IV) shown in Figure 2. The graphs in Figure 2 are drawn in proportion to Figure 1 and have the same axes.

![Figure 2](image)

Question 57
Which graph best represents the total cost per month for three different rental costs at a charge of 10 cents a call?
A  I  
B  II  
C  III  
D  IV
Questions 58 and 59 refer to the following additional information:
Abby considers further the Phonewise plans.

Question 58
Phonewise decide to set up spreadsheets on their web site that will allow customers to calculate the cost for each plan. They use \( T \) for the total cost per month in dollars and \( n \) for the number of calls.

A mathematical formula that could be used to calculate the total cost per month in dollars for the Premium plan is

\[
\text{A} \quad T = 0.20n + 10 \\
\text{B} \quad T = 5n + 10 \\
\text{C} \quad T = 10n + 30 \\
\text{D} \quad T = 20n + 10
\]

Question 59
Premium, Timewise and Business plans would all result in the same total monthly cost for customers

A with 150 calls per month.  
B with 200 calls per month.  
C with 250 calls per month.  
D in none of the above situations.

Question 60 refers to the following additional information:
A second telephone company, Connect, has recently been formed. They offer the Superconnect plan. Superconnect customers pay a monthly rental of $20 plus 10 cents per call.

Question 60
One customer thought about changing from Timewise to Superconnect but decided not to do this because the Phonewise company had been very reliable.

After 6 months at 200 calls per month, how much would the customer have saved if she had changed?

A $0  
B $10  
C $30  
D $60
UNIT 22

Questions 61 and 62
A shop that sells canned foods to customers (who will store the cans in different conditions) uses the following table (Table 1) to advise them. The table provides information about the percentage of vitamin activity that remains in some canned foods under different conditions of temperature and different storage times. The table gives information for vitamin C and another vitamin, thiamine.

Table 1

<table>
<thead>
<tr>
<th>Storage time</th>
<th>Temperature °C</th>
<th>Percentage of vitamin activity remaining in canned food</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Peas</td>
</tr>
<tr>
<td>12 months</td>
<td>10</td>
<td>93</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>91</td>
</tr>
<tr>
<td></td>
<td>27</td>
<td>86</td>
</tr>
<tr>
<td>24 months</td>
<td>10</td>
<td>91</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>89</td>
</tr>
<tr>
<td></td>
<td>27</td>
<td>81</td>
</tr>
</tbody>
</table>

Question 61
According to the table, in which one of the following situations is the smallest percentage of thiamine activity lost from the canned foods?

A tomatoes kept at 27 °C for 12 months  
B orange juice kept at 27 °C for 24 months  
C peas kept at 27 °C for 12 months  
D peas kept at 18 °C for 24 months

Question 62
According to the table, in which one of the following situations is the greatest percentage of vitamin activity lost from the canned foods?

A thiamine in peas kept at 27 °C for 12 months  
B thiamine in tomatoes kept at 18 °C for 24 months  
C vitamin C in orange juice kept at 27 °C for 12 months  
D vitamin C in orange juice kept at 18 °C for 24 months
UNIT 23

Questions 63 – 67

Each of the questions in this unit contains a statement relating to Etruscan civilisation. You need to evaluate each statement according to the following key, using only the information provided in the map on the opposite page.

Key:
Choose
A if the map provides evidence only in support of the statement
B if the map provides evidence only against the statement
C if the map provides neither evidence in support of nor against the statement
D if the map provides both evidence in support of and against the statement

Note:
• the term ‘map’ refers to both the drawing and accompanying text;
• Punic/Carthaginian, Greeks, Corsica and Phoenician all refer to neighbouring lands or peoples.

Question 63
The Etruscans could read and write.

Question 64
Etruscan power was always centred on Clusium (middle section of the map).

Question 65
The Etruscans were militarily strong.

Question 66
Etruscan civilisation was more peaceful than Roman civilisation.

Question 67
The Italian coastline has remained unchanged over time.
The map below outlines certain aspects of Etruscan civilisation. Etruscan civilisation flourished and was at its height in central Italy during the period 800–600 BC.

**The Etruscans**

The Etruscans were the creators of the first Italian civilisation. They inhabited a group of loosely associated city-states, which were gradually conquered by Rome from the latter part of the 6th century BC onwards. The Etruscans also displayed the strong influence of Greek art.

- **Used Ilva iron, perhaps originally an island**
- **Iron mines**
  - Originally on or near sea
- **Bronzework and many imported vases**
- **Bronze industry supreme until c.650 BC**
- **Metals**
  - Name recalls joint Etruscan-Punic efforts which kept Greeks out of Corsica
- **Carthaginian (Punic) colony**
- **Bilingual Etruscan-Phoenician inscriptions**
- **By 600 BC leading city**
- **Greatest days from 550 BC**
  - Fell to Rome 399 BC

**Metal workings from 8th century BC**

- **Used Ilva iron, perhaps originally an island**

**Dominant by 500 BC**

**Italian towns under temporary Etruscan domination**

**Kilometres**

**0** **30**