Arithmetic & Money Revision Questions

1. **Percentage error**

   e.g. The distance between Dublin and Lisbon is estimated to be 1500 km. The true distance is $1638 \cdot 92$ km. Calculate the percentage error in the estimate.

2. **Accumulation of error**

   e.g. If $p = (12 \cdot 7 \pm 0 \cdot 15)$ km and $q = (10 \cdot 5 \pm 0 \cdot 1)$ km , calculate the percentage error in

   (i) $p + q$, (ii) $p - q$.

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3. **Tolerance and tolerance intervals**
   e.g. A ruler is scaled with marks showing every two millimetres.
   (i) What is the tolerance of this ruler?
   (ii) This ruler measures a length to be $8 \cdot 7$ cm. What is the tolerance interval for the length?
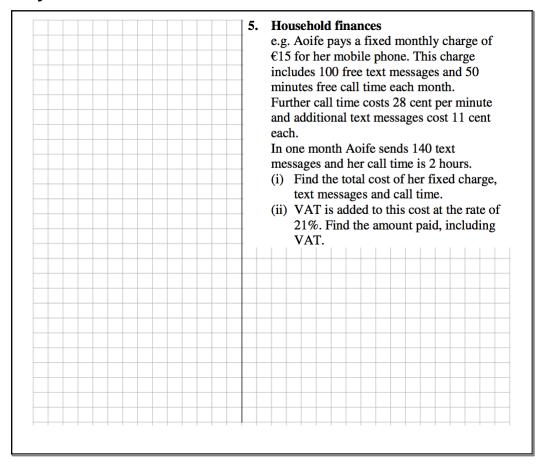
4. **Order of magnitude**
   e.g. Obtain an order of magnitude estimate for the number of heart-beats in a human life. (Average number of heartbeats per minute is about 80, average lifespan is about 80 years.)

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5. **Household finances**

   e.g. Aoife pays a fixed monthly charge of €15 for her mobile phone. This charge includes 100 free text messages and 50 minutes free call time each month.

   Further call time costs 28 cent per minute and additional text messages cost 11 cent each.

   In one month Aoife sends 140 text messages and her call time is 2 hours.

   (i) Find the total cost of her fixed charge, text messages and call time.

   (ii) VAT is added to this cost at the rate of 21%. Find the amount paid, including VAT.

6. **Income Tax**

   e.g. Miriam has an income after tax of €5158 for a particular month. Her tax credits are €320 for the month and the standard rate cut off point is €2950. The standard and higher rates of tax are 20% and 41% respectively. Calculate her gross income for the month.

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