Banker Questions 1

1. Evaluate

$$7.18 - 2.1 \times 3$$ **2 KU**

2. Evaluate

$$1\tfrac{1}{8} \div \tfrac{3}{4}$$ **2 KU**

3. Solve the inequality

$$5 \acute{o} x > 2(x + 1)$$ **3 KU**

4. $f(x) = x^2 + 5x$,   evaluate $f(-3)$ **2 KU**

5. *(a)* Factorise $p^2 - 4q^2$ **1 KU**

   (b) Hence simplify

$$\frac{p^2 - 4q^2}{3p + 6q}$$ **2 KU**

6. $L = \tfrac{1}{2}(h - t)$

   Change the subject of the formula to h **2 KU**

7. In 1999, a house was valued at £90,000 and the contents were valued at £60,000.

   The value of the house **appreciates** by 5% each year.

   The value of the contents **depreciates** by 8% each year.

   What will be the **total** value of the house **and** contents in 2002 ?   **3 KU**

8. A microwave oven is sold for £150.
   This price includes VAT at 17.5%
   Calculate the price of the microwave oven without VAT.   **3 KU**

9. How many chocpops will be eaten in the year 2012.

   Give your answer in **scientific notation**   **2 KU**

10. To make õ14 caratö gold, copper and pure gold are mixed in the ratio 5:7.
    A jeweler has 160 grams of copper and 245 grams of pure gold.
    What is the maximum weight of õ14 caratö gold that the jeweler can make?   **3 RE**

11. The electrical resistance, R, of copper wire varies directly as its length,
    L metres, and inversely as the square of its diameter, d millimetres .

    Two lengths of copper wire, A and B, have the same resistance.

    Wire A has a diameter of 2 millimetres and a length of 3 metres.
    Wire B has a diameter of 3 millimetres

    What is the length of wire B.   **4 RE**

12. A weight on the end of a string is spun in a circle on a smooth table.
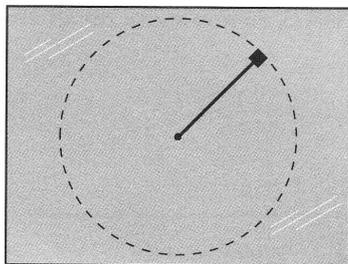
    The tension, T, in the string varies directly as the square of the speed, v,
    and inversely as the radius, r, of the circle.

    (a) Write down a formula for T in terms of v and r.   **1 KU**

    (b) The speed of the weight is multiplied by 3 and the radius of the string
           is halved.

           What happens to the tension in the string.   **2 RE**

13. John's school sells 1200 tickets for a raffle.
    John buys 15 tickets.

    John's church sells 1800 tickets for a raffle.
    John buys 20 tickets.

    In which raffle has he a better chance of winning the first prize ?   **3 RE**
    Show clearly all your working.

14. A random check is carried out on the contents of a number of matchboxes.
    A summary of the results is shown in the boxplot below.

    47   50   51   53   54
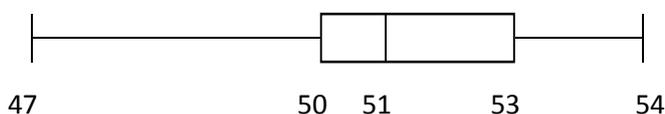
    What percentage of matchboxes contains fewer than 50 matches.   **1 RE**

15. In a class, 30 pupils sat a test.
   The marks are illustrated by the stem and leaf diagram below.

Test Marks

```
0 | 9
1 | 6 6 7 8
2 | 0 4 5 7 9 9 9
3 | 2 2 3 5 5 6 8
4 | 0 2 3 4 5 5 7 7 8
5 | 0 0
```

n = 30   1 | 6 = 16

   (a) Write down the median and the modal mark.   **2 KU**

   (b) Find the probability that a pupil selected at random scored **at least** 40 marks.   **1 KU**

16. The average monthly temperature in a holiday resort was recorded in
   degrees Celsius (°C).

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Average Temperature (°C)	1	8	8	10	15	22	23	24	20	14	9	4

   Draw a suitable statistical diagram to illustrate the median and the quartiles
   of this data.   **4 RE**

17. Bottles of juice should contain 50 millilitres.
   The contents of 7 bottles are checked in a random sample.
   The actual volume in millilitres are as shown below:

   52,   50,   51,   49,   52,   53,   50

   Calculate the mean and standard deviation of the sample.   **4 KU**

18. A garage carried out a survey on 600 cars.
   The results are shown in the table below:

Engine size (cc)

Age		0 ó 1000	1001 ó 1500	1501 ó 2000	2001 +
	Less than 3 years	50	80	160	20
	3 years or more	60	100	120	10

   (a) What is the probability that a car chosen at random, is less than 3 years old?   **1**

   (b) In a sample of 4200 cars, how many would be expected to have an
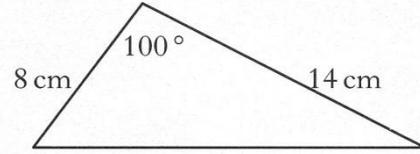   engine size greater than 2000cc and be 3 or more years old.   **2**

19. A metal doorstop is prism shaped,
    as shown in Figure 1   *Figure 1.*
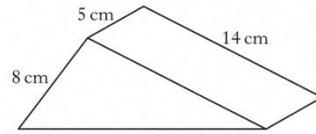
    The uniform cross-section
    as shown in Figure 2:   *Figure 2.*

    Find the volume of metal required
    to make the doorstop.   **4 KU**

20. A cylindrical soft drinks can is 15 centimetres in height and
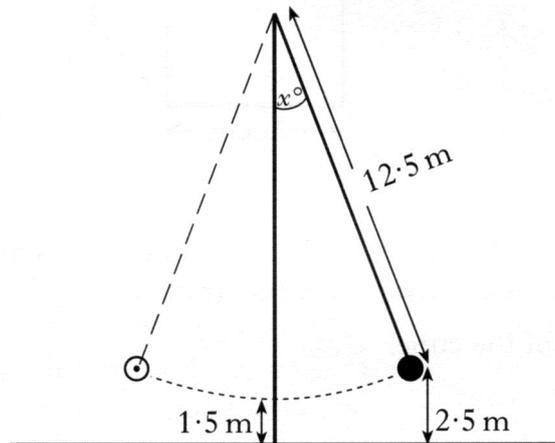   6.5 centimetres in diameter.

    A new cylindrical can holds the same volume but has a reduced height
    of 12 centimetres.

    What is the diameter of the new can ?

    Give your answer to 1 decimal place.   **4 RE**

21. The chain of a demolition ball is 12.5 metres long.
    When vertical, the end of the chain is 1.5 metres from the ground.

    It swings to a maximum height of 2.5 metres above the ground on both sides.

    (a) At this maximum height, show that the angle x°, which the chain
         makes with the vertical, is approximately 23°   4

    (b) Calculate the maximum length of the arc through which the end of the
         chain swings. Give your answer to 3 significant figures.   4