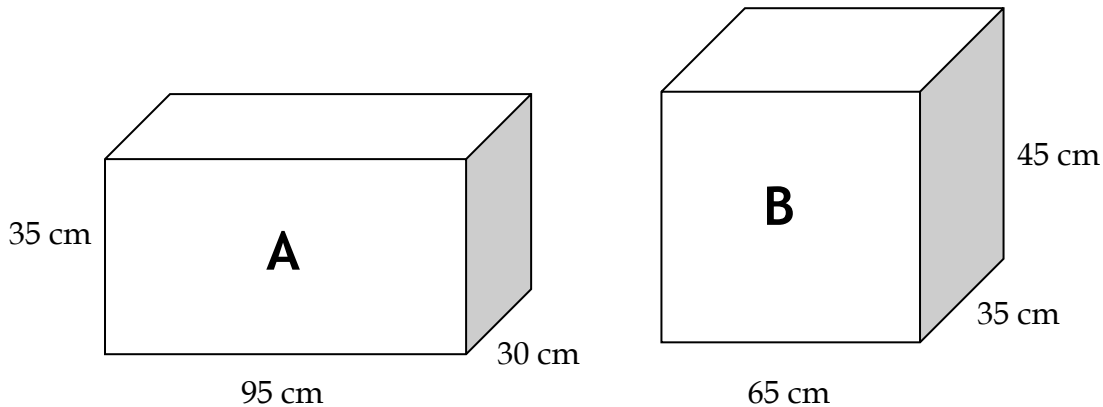




## FA Problem Solving Questions - Set 3a

21a. The diagram shows two fish tanks, each in the shape of a cuboid.

Diagram NOT  
accurately drawn



Finley fills both fish tanks with water.

Which fish tank holds the most water?  
You must show all your calculations.

(4 marks)

22a. A basic calculator costs £3  
A scientific calculator costs £5  
Julie spends less than £100 on calculators.

Work out the greatest number of calculators that Julie could have bought.

(3 marks)

23a. A customer who cancels a holiday with Funtours has to pay a cancellation charge. The cancellation charge depends on the number of days before the departure date the customer cancels the holiday.

The cancellation charge is a percentage of the cost of the holiday.  
The table shows the percentages.

Number of days before the departure date the customer cancels the holiday	Percentage of the cost of the holiday
29-55	40%
22-28	60%
15-21	80%
4-14	90%
3 or less	100%

The cost of Amy's holiday was £840  
She cancelled her holiday 25 days before the departure date.

(a) Work out the cancellation charge she had to pay.

(2 marks)

The cost of Carol's holiday was £600

She cancelled her holiday and had to pay a cancellation charge of £480

(b) Give the range of the number of days in which Carol cancelled her holiday.

(3)

24a. This is a list of ingredients for making a pear & almond crumble for 4 people.

Ingredients for 4 people: 80 g plain flour 60 g ground almonds 90 g soft brown sugar 60 g butter 4 ripe pears
--

Jessica wants to make a pear & almond crumble for 10 people.

Here is a list of the amount of each ingredient Jessica has in her cupboard.

250 g plain flour  
100 g ground almonds  
200g soft brown sugar  
150 g butter  
8 ripe pears

Work out which ingredients Jessica needs to buy more of. You must show all of your working.

(4 marks)

25a. Peter works out the cost of the gas he used last year.

At the start of the year, the gas meter reading was 12967 units.

At the end of the year, the gas meter reading was 14059 units.

Each unit of gas he used cost 44p.

Work out the mean cost per month of the gas he used last year.

(5 marks)

26a. Stephen imports cars from the USA. He sells them in the UK.

He has just bought a car in the USA costing \$24 000.

It cost him £900 to import the car to the UK.

The exchange rate is £1 = \$1.45

Stephen needs to make a profit of 20% on his total costs.

Work out the least amount that Stephen must sell the car for in the UK.

Give your answer in pounds.

(3 marks)

27a. Stuart and Helen play a game with red and blue cards.

Red cards are worth 4 points each.

Blue cards are worth 1 point each.

Stuart has  $r$  red cards and  $b$  blue cards.

Helen has 2 red cards and twice as many blue cards as Stuart.

The total number of points of Stuart and Helen's cards is  $T$ .

Write down, in terms of  $r$  and  $b$ , a formula for  $T$

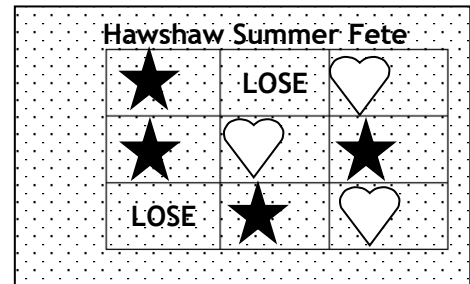
(4 marks)

28a. The Hawshaw Summer Fete is running a competition.

You buy a scratch card with 9 squares covered up.

Under the 9 squares on each card, randomly placed are 4 stars, 3 hearts and 2 LOSE.

Michelle buys a scratch card.



You scratch off two squares and win if you get 2 hearts or 2 stars.

a) What is the probability of 2 stars being revealed.

b) What is the probability of 2 hearts being revealed.

Work out the probability that this will be a winning scratch card.

(3)

There are 1440 tickets sold at the Fete.

Estimate how many winning scratch cards will be sold.

(4)

29a. Angel Ltd manufacture components for washing machines. The probability that a component will be made within a tolerance of one tenth of a millimetre is 0.995.

Angel Ltd. manufacture 10 000 components each day.

Work out an estimate for the number of components that will not be within the tolerance of one tenth of a millimetre each day.

(3 marks)

30a. Here are two fractions,  $\frac{2}{3}$  and  $\frac{5}{7}$

Which fraction has the lower value?

You must show clearly how you got your answer.

(3 marks)