GCSE Mathematics Practice Tests: Set 4

Paper 2F (Calculator)
Time: 1 hour 30 minutes

You should have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator.

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- **Calculators may be used.**
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- You must **show all your working out.**

Information

- The total mark for this paper is 80
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Answer ALL questions.
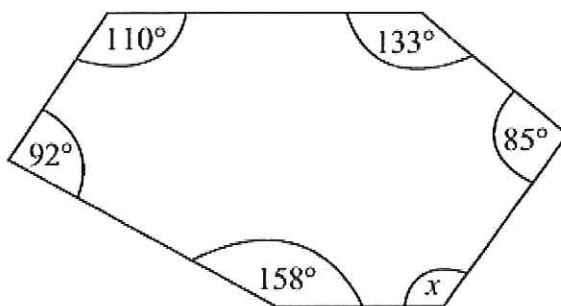
Write your answers in the spaces provided.

You must write down all the stages in your working.

1.   Simplify $3 \times a \times 5 \times b$

15ab

(Total 1 mark)

2.   Here is a hexagon.

The angles of a hexagon add up to 720°.

Work out the size of the angle marked *x*.

$720 - (92 + 110 + 133 + 85 + 158)$

$72 - 578$

$= 142°$

142 °

(Total 2 marks)

3. The table shows the names of five of Janette's friends.

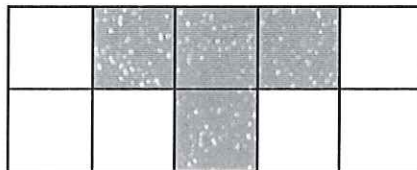| Boys	Girls
Dodi	Anna
James	Michelle
William	

Janette is going to play a team game.
She chooses one of the boys and one of the girls to be in her team.

Write down all the possible combinations Janette can choose.

(D, A) , (D, M), (J, A), (JM), (W, A) (W, M)

....

....

(Total 2 marks)

4.

4 out of 10 shaded

(i) What percentage of this shape is shaded?

.............*40*.........%

(ii) Write your answer to part (i) as a decimal.

.............*0.4*.........

(Total 2 marks)

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5. Here are some words that can be used to describe the probability that an event will happen.

> certain   impossible   likely   unlikely   evens

(a) Write down the word that best describes the probability

(i) that you will win a raffle when 400 tickets are sold and you have 10 of the tickets,

un likely

(ii) that you get a 10 when you roll an ordinary dice.
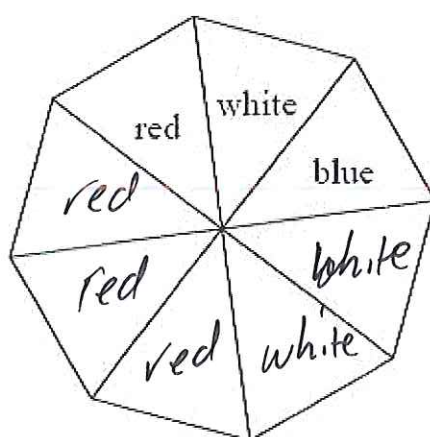
imposs.ble

(2)

Ayesha is making a fair 8-sided spinner.
The spinner already has the colours red, white and blue written on it.

The probability that the spinner lands on red will be $\dfrac{1}{2}$

The probability that the spinner lands on blue will be less than the probability that the spinner lands on white.

(b) Complete the spinner by writing on it the colours that are missing.

(2)

(Total 4 marks)

7. The length of a bus is 10 metres.

Gurjeet makes a model of the bus.
He uses a scale of 1 cm to 40 cm.

Work out the length of the model of the bus.
Give your answer in centimetres.

$10m = \dfrac{1000cm}{40} = 25cm$

.... 25 .... cm

(Total 2 marks)

6. There are 400 counters in a bag.

36% of the counters are yellow. 36%

$\frac{2}{5}$ of the counters are blue. $= 40\%$
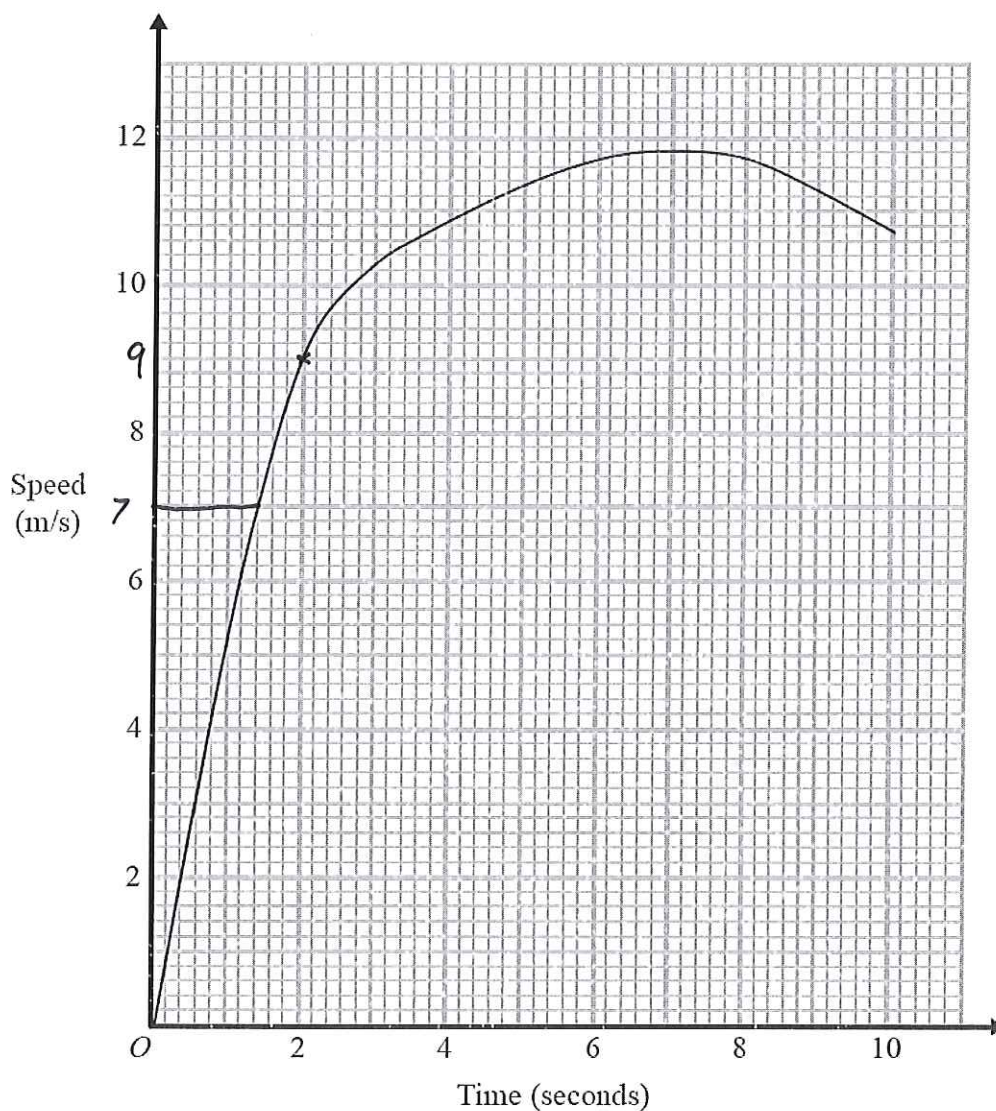
The rest of the counters are green. $100 - 76 = 24\%$

Work out how many counters are green.

$$\frac{400}{100} \times 24 = 96.$$

96

(Total 4 marks)

8.   Usain runs in a race.
The graph shows his speed, in metres per second (m/s), during the first 10 seconds of the race.

(a) Write down Usain's speed at 2 seconds.

..................9.............. m/s

(1)

(b) Write down Usain's greatest speed.

..................11.8.............. m/s

(1)

(c) Write down the time at which Usain's speed was 7 m/s.

..................1.4.............. seconds

(1)

(Total 3 marks)

9. Michael writes down 4 different factors of 60

He adds the 4 factors together.
He gets a number greater than 20 but less than 35

What 4 factors could Michael have written down?

1×60
2×30
3×20
4×15
5×12
6×10

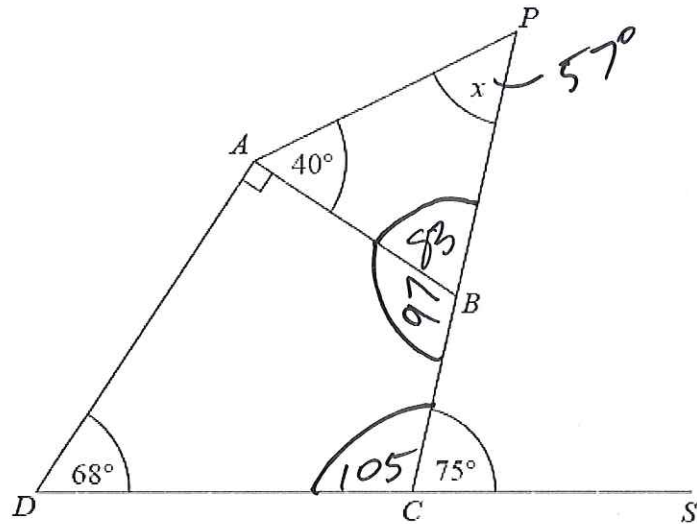$4 + 5 + 6 + 10 = \underline{24}$ <u>Many</u> alternatives

$20 < 24 < 35$

.........4.........5.........6.........10.........

(Total 3 marks)

Angles on a straight
line add up to 180°   Angles in triangle = 180°
,,   ,,   quad = 360°

10.

ABCD is a quadrilateral.
DCS and PBC are straight lines.

Angle BAD = 90°
Angle ADC = 68°
Angle PAB = 40°
Angle PCS = 75°

Work out the size of the angle marked x.
Give reasons for your answer.

$DCB = 180 - 75 = 105°$

$ABC = 360 - (105 + 68 + 90)$
$360 - 263$
$= 97°$

$ABP = 180° - 97 = 83°$

$x = 180 - (83 + 40)$
$180 - 123$
$= 57°$

$x = 57°$

(Total 4 marks)

11. Mr Smith kept a record of the number of absences for each student in his class for one term. Here are his results.

$$0 \quad 0 \quad 0 \quad 8 \quad 4 \quad 5 \quad 5 \quad 3 \quad 2 \quad 1$$

(a) Write down the mode.

most common

.............0............
(1)

(b) Work out the mean. *average.*

10 students total.

So... $\dfrac{0+0+0+8+4+5+5+3+2+1}{10}$

$= \dfrac{28}{10} = 2.8$

.............2.8............
(2)

(Total 3 marks)

12. You can use this rule to work out the total cost, in pounds, of hiring a pressure washer.

> Multiply the number of days by 5.4 and then add 15

Ali hires a pressure washer.
The total cost is £52.80

(a) Work out how many days Ali hires the pressure washer for.

$52.80 - 15 = 37.80$

$\dfrac{37.80}{5.4} = 7$

..............7..............days

(2)

Ben hires a pressure washer for y days.
The total cost is £C.

(b) Write down a formula for C in terms of y.

$C = 5.4y + 15$

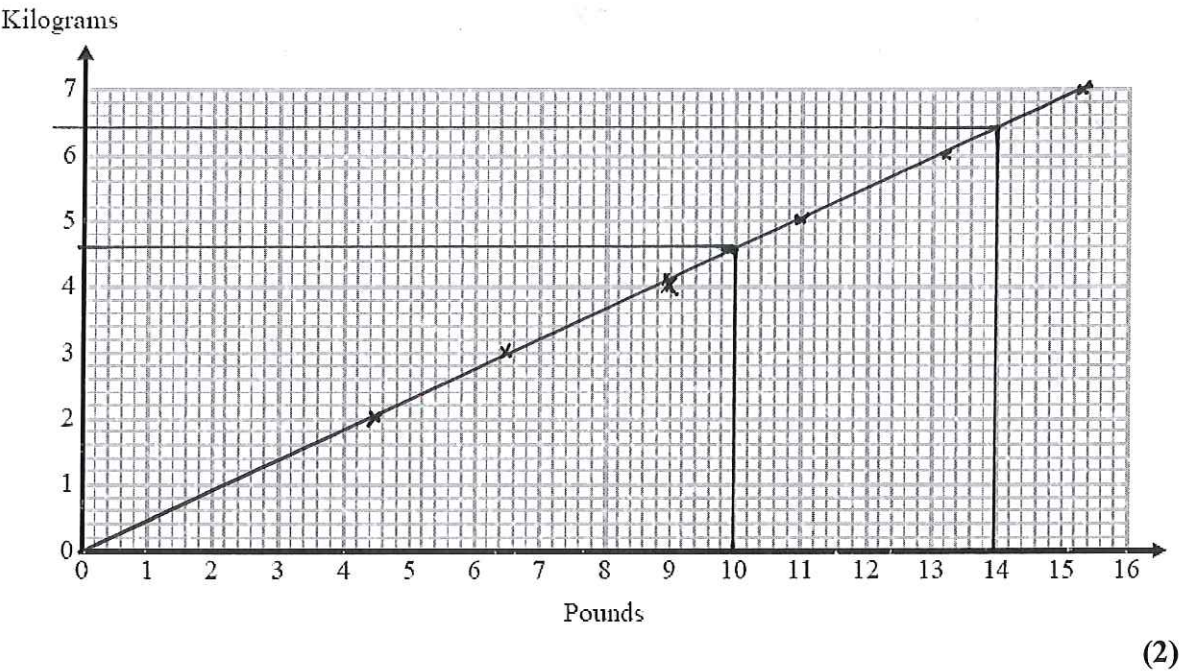..............$C = 5.4y + 15$..............

(2)

(Total 4 marks)

13. Mary works in a maternity unit.
She weighs the babies.

The table shows some weights in both pounds and kilograms.

pounds	4.4	6.6	8.8	11	13.2	15.4
kilograms	2	3	4	5	6	7

(a) Use this table to draw a conversion graph to change between pounds and kilograms.
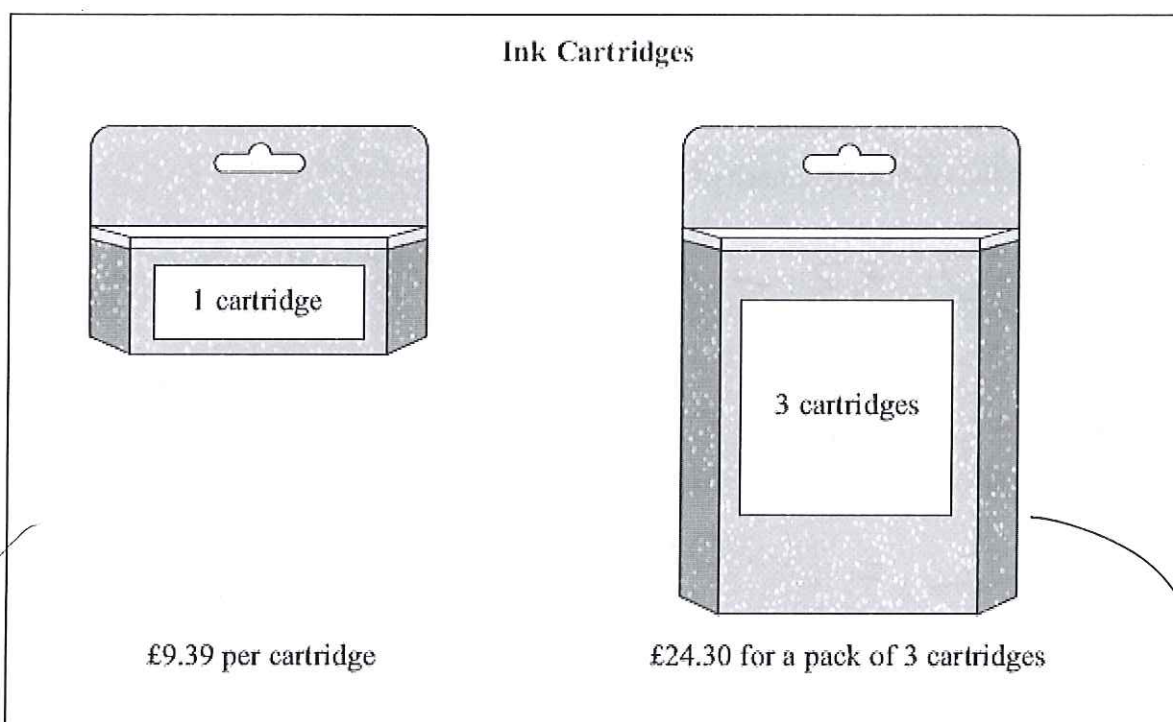

(2)

(b) Change 10 pounds to kilograms.

.... 4.6 .... kilograms

(1)

(c) Change 6.5 kilograms to pounds.

.... 14 .... pounds

(1)

(Total 4 marks)

14. George is going to buy exactly 10 ink cartridges.

Ink Cartridges

1 cartridge

3 cartridges

£9.39 per cartridge   £24.30 for a pack of 3 cartridges

Find the difference in cost between the cheapest way and the most expensive way to buy the 10 ink cartridges.

10 × 9.39
= £93.90

can't buy 10 in 3 packs.
∴ must buy 4 lots.
24.30 × 4 = £97.20

97.20
− 93.90
——————
£3.30

£3.30
....

(Total 5 marks)

15. Henri and Ray buy some flowers for their mother.

They buy

3 bunches of roses for £6.99
1 bunch of roses and 2 bunches of tulips for £4.45

(a) Work out the cost of one bunch of tulips.

$$\frac{6.99}{3} = £2.33 - 1 \text{ bunch roses}$$

$$4.45 - 2.33 = 2.12 - 2 \text{ bunches of tulips}$$

$$\therefore \frac{2.12}{2} = 1.06$$

£.......1.06.......

(3)

Henri and Ray share the total cost of £11.44 in the ratio 5:3   5 + 3 = 8

(b) Work out how much Henri pays and how much Ray pays.

$$\frac{11.44}{8} = 1.43 - 1 \text{ part.}$$

Henri = 1.43 × 5 = 7.15
Ray = 1.43 × 3 = 4.29

Henri £.......7.15.......

Ray £.......4.29.......

(3)

(Total 6 marks)

16. Brian wants to go on holiday.
He is going to take out a loan of £500 to help pay for the holiday.

$120\% = 1.2$

Brian will have to pay back the £500 plus 20% interest over 12 months.
He will pay back the same amount of money each month.

How much money will he need to pay back each month?

$500 \times 1.2 = £600$ repayment.

$$\frac{600}{12} = £50$$

£ .... 50 ....

(Total 4 marks)

$$a^2 + b^2 = c^2$$

17.

B

C

18.6 cm

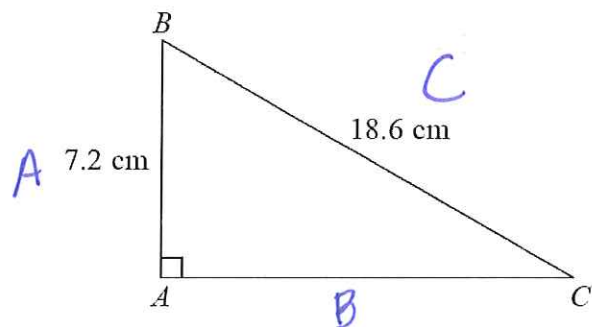A 7.2 cm

A   B   C

Diagram **NOT** accurately drawn

Calculate the length of *AC*.
Give your answer correct to 3 significant figures.

$$\therefore c^2 - a^2 = b^2$$
$$18.6^2 - 7.2^2 = 294.12$$
$$= \sqrt{294.12}$$
$$= 17.149...$$

17.1 .... cm

(Total 3 marks)

18. Chris has two children, Beth and Amy.
Beth is 10 years older than Amy.

$x + 10$ x

Chris says,

    "I am twice as old as the sum of Beth's age and Amy's age."

Chris is 40 years old.

How old is Amy?

$Amy = x$ $Beth = x + 10$

$Chris = 2(x + x + 10)$

$Chris = 2(2x + 10)$

$\quad\quad = 4x + 20)$

$\therefore \quad 40 = 4x + 20$

$\quad\quad 20 = 4x$

$\quad\quad 5 = x$

$Amy = 5, \quad Beth = 15$

$Chris = 2(5 + 15) = 40$ ✓

5

..............................years old

(Total 4 marks)

19. A shop sells tins of beans in three different sizes.

BEANS 150 g 35p	BEANS 200 g 45p	BEANS 300 g 80p
A	**B**	**C**
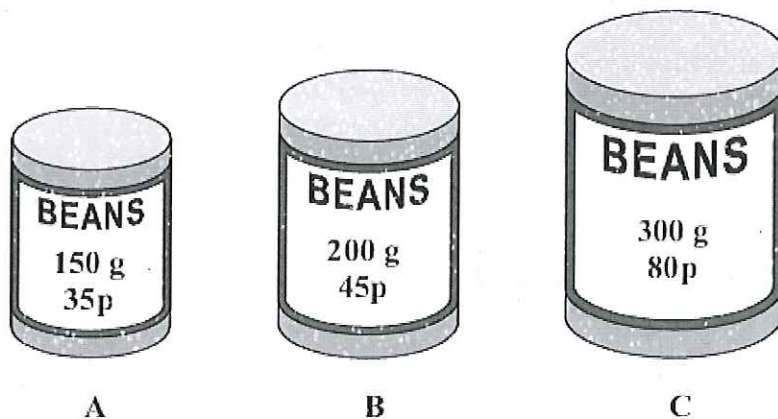
Kathy wants to buy exactly 750 g of beans.
She wants to buy the beans at the cheapest possible cost.

Work out the cheapest cost.
You must show all your working.

$5A = 750g = 35p \times 5 = £1.75$

OR

$3B + A = 750g = (3 \times 45p) + (1 \times 35p) = £1.70$

OR

$2C + A = (2 \times 80p) + 35p = £1.95$

OR

$3A + C = (3 \times 35p) + 80p = £1.85.$

Cheapest cost is to buy 3 200g cans and
1 150g can, costing £1.70

(Total 4 marks)

20. Joe and Ann buy some fruit from the same shop.

Joe buys   4 apples and 3 bananas for £2.50
Ann buys   3 apples and 4 bananas for £2.40

Work out the cost of

(i)   one apple, a

(ii) one banana. b

$$\overset{3}{\times}4a + 3b = 250_p$$
$$\overset{4}{\times}3a + 4b = 240_p$$

$$12a + 9b = 750$$
$$12a + 16b = 960$$

Subtract. $-12a - 9b$

$$\overline{}$$

$$7b = 210 \quad \therefore b = 30_p$$

Substitute $b = 30$

$$4a + 90 = 250_p$$
$$4a = 250 - 90$$
$$4a = 160$$

$$\therefore \cancel{4}a = 40_p$$

(i) one apple ....40.......... p

(ii) one banana ....30.......... p

(Total 5 marks)

21. $\mathscr{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$

$A = \{\text{even numbers}\}$

$B = \{\text{multiples of 3}\}$

(*a*) List the members of set B.

.........3, 6, 9.........
(1)

(*b*) Find $A \cup B$

.........2, 5, 4, 6, 8, 9, 10
(1)

(*c*) Find $A \cap B$

.........6.........
(1)

x is a member of $\mathscr{E}$

$x \in B$

$x \notin A$

(*d*) What are the possible values of x?

.........3, 9.........
(2)

(Total 5 marks)

22. Neville saw this car for sale.

He got a discount of 25% off the price of the car.
He paid £7200 for the car.

Work out the price of the car before the discount.

25% off original price
Now £7200

$100\% - 25\% = 75\% = 0.75$

$£7200 \div 0.75$

$= £9600$

(OR)

$7200 = 75\%$

$\therefore 1\% = \dfrac{7200}{75}$

$1\% = £96$

$100\% = 96 \times 100$

$= 9600$

£ ......9600......

(Total 3 marks)

23. Keith, Ben and Liz tested a coin to find out if it was biased.
They each threw the coin a number of times.
They counted the number of heads and the number of tails they each got.

The table gives information about their results.

	Keith	Ben	Liz
Number of heads	12	34	57
Number of tails	28	66	243

(a) Which person, Keith, Ben or Liz, will have the best estimate for the probability of getting a head on this coin? Explain your answer.

Liz will have the best estimate because she carried out the most trials.

(1)

(b) Using all the results in the table, work out an estimate for the probability that the next throw of the coin will be a head.

Number of heads = 12 + 34 + 57 = 103

Number of total throws = 12 + 34 + 28 + 66 + 57 + 243
= 440

Probability of Heads = $\frac{103}{440}$ = 0.23

0.23 or $\frac{103}{440}$

(2)

(Total 3 marks)

TOTAL FOR PAPER IS 80 MARKS