GCSE Mathematics

Practice Tests: Set 10

Paper 2H/3H (Calculator)

Time: 1 hour 30 minutes

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

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*.
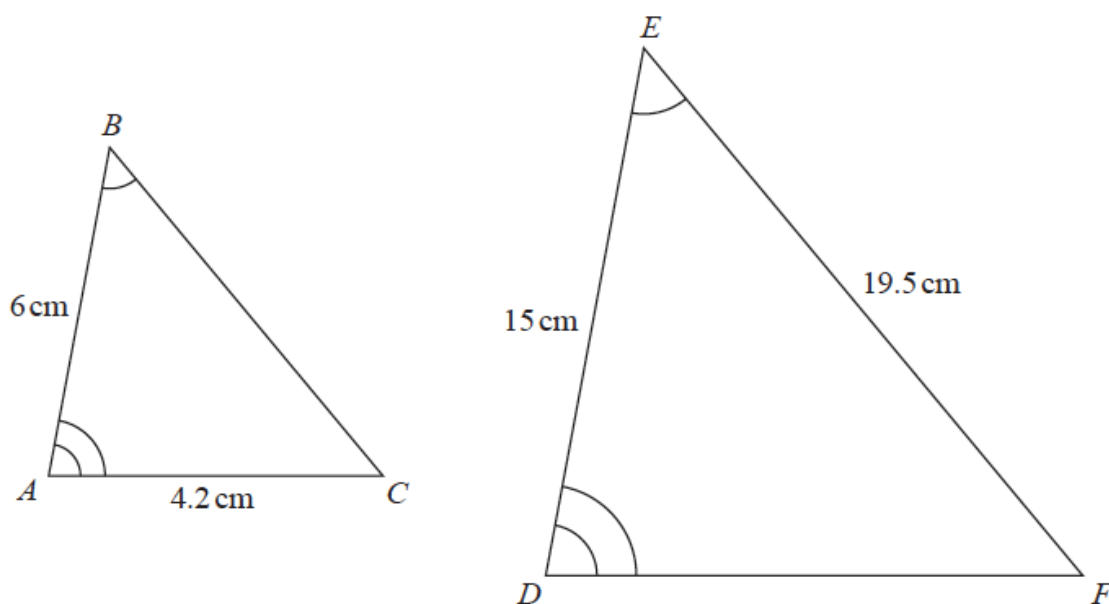
Advice

- 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 TWENTY FOUR questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1   *ABC* and *DEF* are similar triangles.

(*a*)   Work out the length of *DF*.

....cm

(2)

(*b*)   Work out the length of *BC*.

....cm

(2)

(Total for Question 1 is 4 marks)

2 The diagram shows a solid cuboid made from wood.

12 cm

8 cm

5 cm
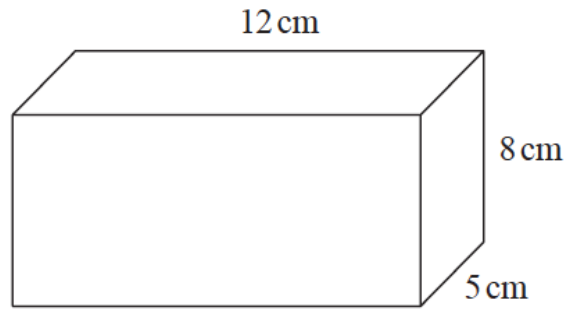
Diagram **NOT**
accurately drawn

The wood has density 0.7 g/cm^3

Work out the mass of the cuboid.

.... grams

(Total for Question 2 is 3 marks)

3   The table shows information about the heights, in cm, of 48 sunflowers in a garden centre.

Height of sunflower (h cm)	Frequency
$90 < h \leq 100$	8
$100 < h \leq 110$	12
$110 < h \leq 120$	15
$120 < h \leq 130$	10
$130 < h \leq 140$	3

Work out an estimate for the mean height of the sunflowers.

....cm

(Total for Question 3 is 4 marks)

4   Solve the simultaneous equations

$$x + 2y = -0.5$$
$$3x - y = 16$$

Show clear algebraic working.

$x =$..

$y =$..

(Total for Question 4 is 3 marks)

5   On 1st January 2016 Lionel bought a boat for £170 000
The value of the boat depreciates by 8% per year.

Work out the value of the boat on 1st January 2019
Give your answer correct to the nearest pound.

£ ....

(Total for Question 5 is 3 marks)

6 The table gives information about the times taken, in minutes, for 80 taxi journeys.

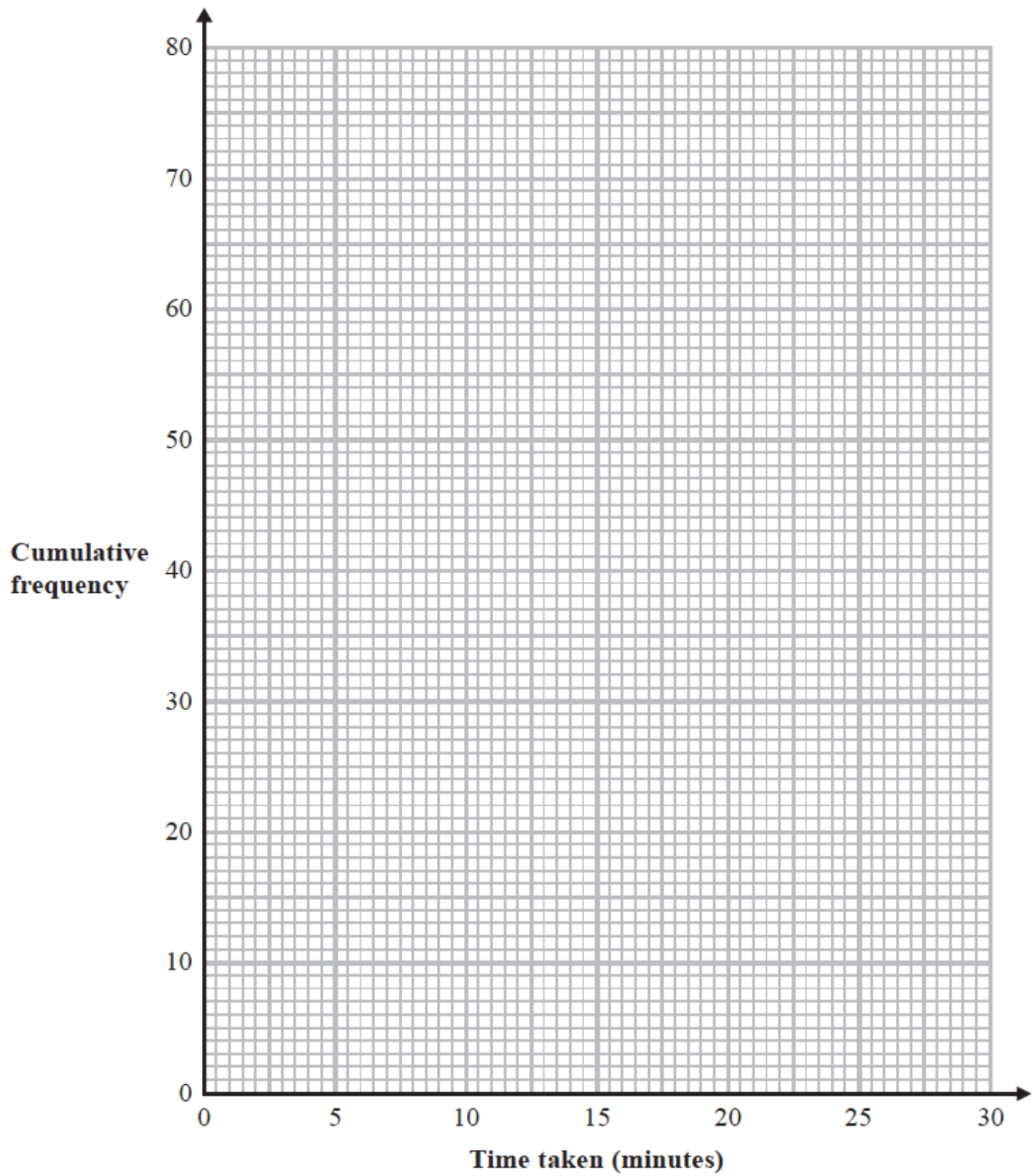| Time taken (*t* minutes)	Frequency
$0 < t \leq 5$	7
$5 < t \leq 10$	10
$10 < t \leq 15$	12
$15 < t \leq 20$	19
$20 < t \leq 25$	18
$25 < t \leq 30$	14

(*a*)   Complete the cumulative frequency table.

Time taken (*t* minutes)	Cumulative frequency
$0 < t \leq 5$	
$0 < t \leq 10$	
$0 < t \leq 15$	
$0 < t \leq 20$	
$0 < t \leq 25$	
$0 < t \leq 30$	

(1)

(*b*)   On the grid provided, draw a cumulative frequency graph for your table.

(2)

(*c*) Use your graph to find an estimate for the median.

....minutes

(1)

(*d*) Use your graph to find an estimate for the interquartile range.

....minutes

(2)
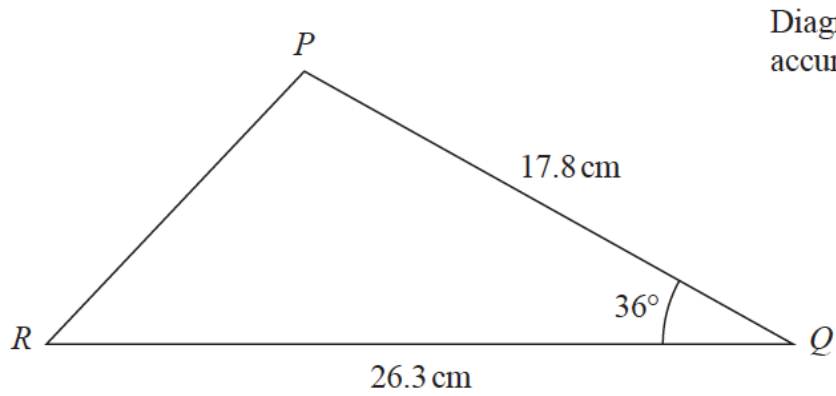
(Total for Question 6 is 6 marks)

7 The diagram shows triangle *PQR*.

Diagram **NOT** accurately drawn

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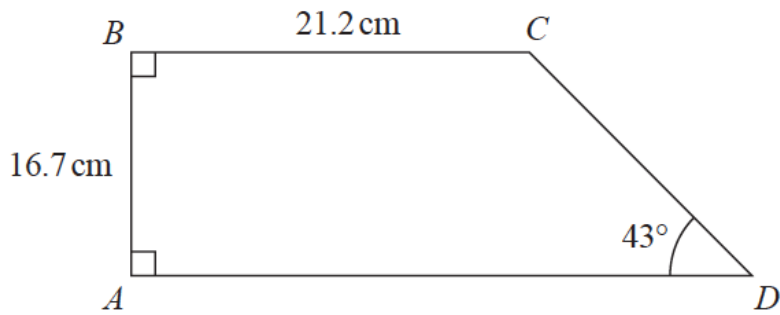Give your answer correct to 3 significant figures.

.... cm

(Total for Question 7 is 3 marks)

8 *ABCD* is a trapezium.

Calculate the perimeter of the trapezium.
Give your answer correct to 3 significant figures.

....cm

(Total for Question 8 is 4 marks)

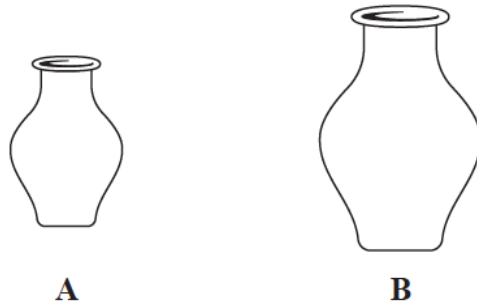**9**   30 students in a class sat a Mathematics test.
The mean mark in the test for the 30 students was 26.8

13 of the 30 students in the class are boys.
The mean mark in the test for the boys was 25

Find the mean mark in the test for the girls.
Give your answer correct to 3 significant figures.

....

(Total for Question 9 is 3 marks)

10 **A** and **B** are two similar vases.

A   B

Vase **A** has height 24 cm.
Vase **B** has height 36 cm.

Vase **A** has a surface area of 960 cm^2

(*a*)   Work out the surface area of vase **B**.

.... cm^2

(2)

Vase B has a volume of V cm^3

(*b*)   Find in terms of V, an expression for the volume, in cm^3, of vase **A**.

.... cm^3

(2)

(Total for Question 10 is 4 marks)

11 Jalina left her home at 10 00 to cycle to a park. On her way to the park, she stopped at a friend's house and then continued her journey to the park.

Here is the distance-time graph for her journey to the park.

Distance from home (km)

Time
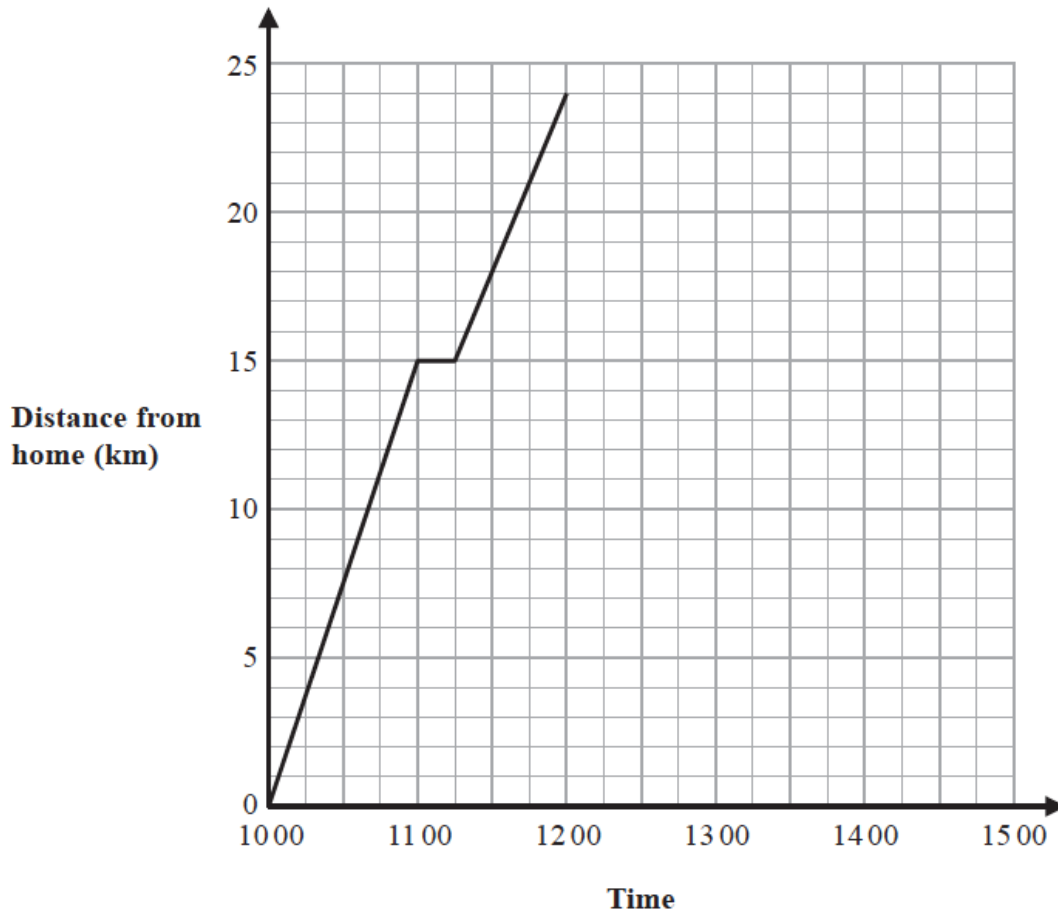
(*a*) On her journey to the park, did Jalina cycle at a faster speed before or after she stopped at her friend's house?

Give a reason for your answer.

....

....

....

(1)

Jalina stayed at the park for 45 minutes. She then cycled, without stopping, at a constant speed of 16 km/h from the park back to her home.

(*b*)   Show all this information on the distance-time graph.

(2)

(*c*)   Work out Jalina's average cycling speed, in kilometres per hour, for the complete journey to the park and back.

Do **not** include the times when she was not cycling in your calculation.
Give your answer correct to 1 decimal place.

.... km/h

(3)

(Total for Question 11 is 6 marks)

12 Change a speed of x kilometres per hour into a speed in metres per second.
Simplify your answer.

....m/s

(Total for Question 12 is 3 marks)

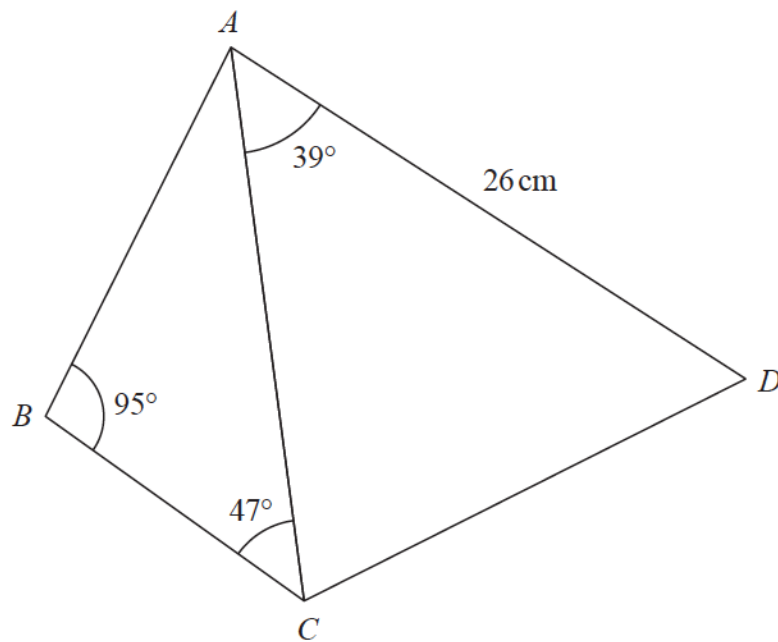**13** The diagram shows cuboid *ABCDEFGH*.
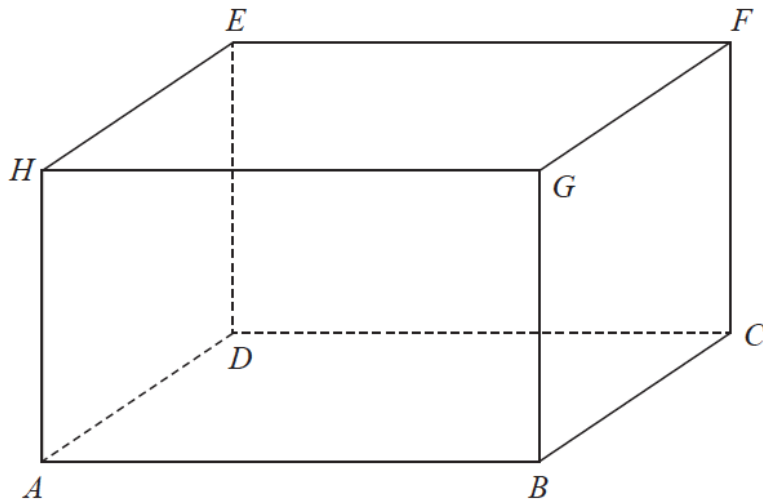
For this cuboid

the length of *AB* : the length of *BC* : the length of *CF* = 4 : 2 : 3

Calculate the size of the angle between *AF* and the plane *ABCD*.
Give your answer correct to one decimal place.

....°

(Total for Question 13 is 3 marks)

14   *ABCD* is a quadrilateral.

The area of triangle *ACD* is 250 cm^2

Calculate the area of the quadrilateral *ABCD*.
Show your working clearly.
Give your answer correct to 3 significant figures.

....cm^2

(Total for Question 14 is 6 marks)

15 y is directly proportional to the cube of x

$y = 20\,h$ when $x = h$ $(h \neq 0)$

(a)   Find a formula for y in terms of x and h

$y =$..

(3)

(b)   Find x in terms of h when $y = 67.5\,h$
Give your answer in its simplest form.

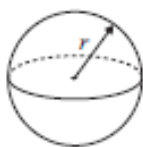$x =$..
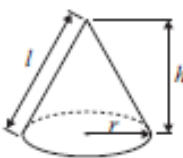
(2)

(Total for Question 15 is 5 marks)

16 A solid is made from a hemisphere and a cylinder.
The plane face of the hemisphere coincides with the upper plane face of the cylinder.
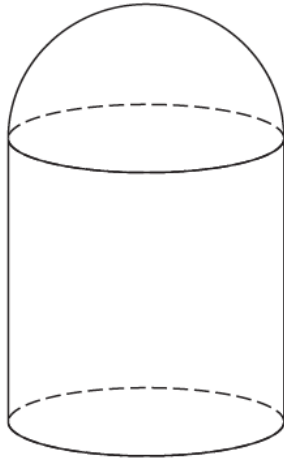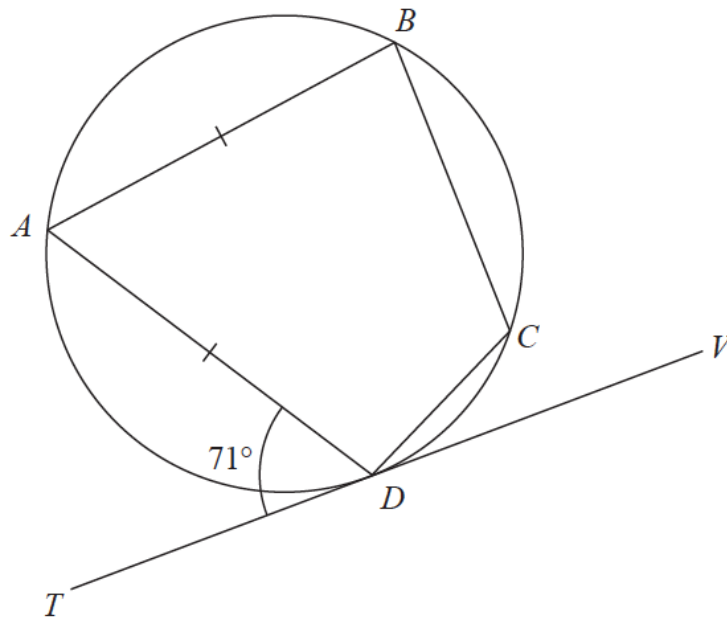

The hemisphere and the cylinder have the same radius.

The ratio of the radius of the cylinder to the height of the cylinder is 1 : 3

Given that the solid has volume 792π cm^3, work out the height of the solid.

.... cm

(Total for Question 16 is 5 marks)

A, B, C and D are points on a circle.
TDV is the tangent to the circle at D.

$AB = AD$
Angle $ADT = 71°$

Work out the size of angle BCD.
Give a reason for each stage of your working.

.... °

(Total for Question 17 is 5 marks)

18 The equation of the line **L** is $y = 9 - x$
The equation of the curve **C** is $x^2 - 3xy + 2y^2 = 0$

L and **C** intersect at two points.

Find the coordinates of these two points.
Show clear algebraic working.

(............................ , ...) and (............................ , ...)

(Total for Question 18 is 5 marks)

19 Hannah has a bag that only contains yellow sweets and orange sweets.
Hannah takes at random 2 sweets from the bag.

The probability that Hannah takes exactly 1 yellow sweet from the bag is $\frac{12}{35}$

Originally there were 3 yellow sweets in the bag.

Work out how many orange sweets there were originally in the bag.
Show your working clearly.

....

(Total for Question 19 is 5 marks)

TOTAL FOR PAPER IS 80 MARKS

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