GCSE Mathematics Practice Tests: Set 2

Paper 2H (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 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. A box is on a table.

The area of the box in contact with the table is 1500 cm^2.
The pressure on the table is 28 newtons/m^2.

Work out the force exerted by the box on the table.

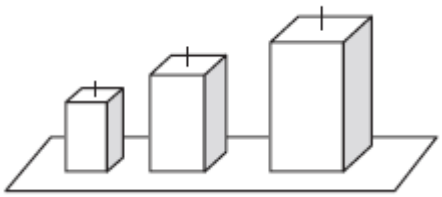
$$p = \frac{F}{A}$$

p = pressure
F = force
A = area

.....newtons

(Total 3 marks)

2. Bilal is making sets of three candles.



He puts a white candle, a silver candle and a gold candle into each set.

The candles are sold in packets of different sizes.

There are

25 white candles in a packet
12 silver candles in a packet
and 8 gold candles in a packet.

Bilal wants to use all the candles he buys.

(i) What is the smallest number of packets of white candles, of silver candles and of gold candles he needs to buy?

..... packets of white candles

..... packets of silver candles

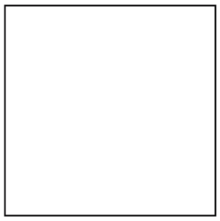
..... packets of gold candles

(ii) How many sets of candles can Bilal make from the packets of candles he buys?

..... sets

(Total 4 marks)

3. A square has sides of length 8.4 cm.



Work out the length of a diagonal of the square.
Give your answer correct to 3 significant figures.

..... cm

(Total 3 marks)

4. There are a total of 120 counters in a box.

There are only red counters and blue counters in the box.
There are three times as many red counters as blue counters in the box.

Carl takes $\frac{1}{3}$ of the red counters from the box.

Kerry takes 80% of the blue counters from the box.
Work out the ratio of the number of red counters to the number of blue counters now in the box.

Give your ratio in its simplest form.

.....

(Total 5 marks)

5. The diagram shows a circular pond with a path around it.

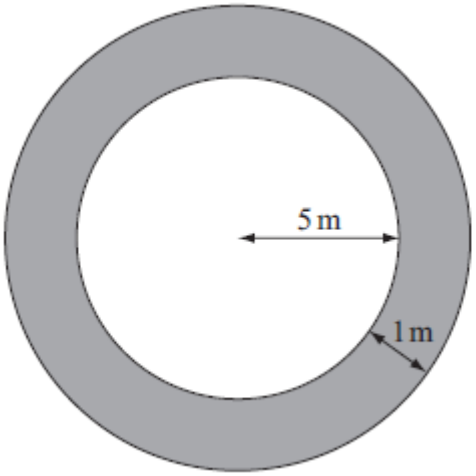


Diagram **NOT** accurately drawn

The pond has a radius of 5m.
The path has a width of 1m.

Work out the area of the path.
Give your answer correct to 3 significant figures.

..... m^2

(Total 3 marks)

6. The total cost of 3 apples and 4 pears is £1.84

The total cost of 5 apples and 2 pears is £1.76

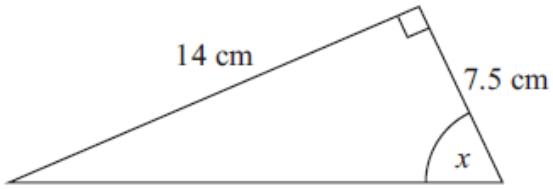
Work out the cost of one apple and the cost of one pear.

Cost of one apple .....p

Cost of one pear .....p

(Total 4 marks)

7. Here is a right-angled triangle.



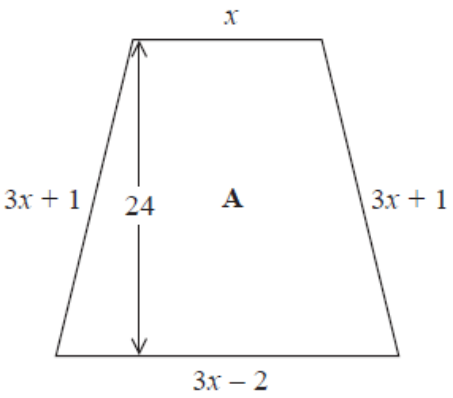
Work out the size of the angle marked *x*.
Give your answer to the nearest degree.

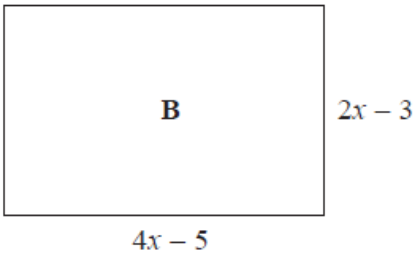
.....°

(Total 3 marks)

8. Jake is making badges of different shapes.

Badge **A** is in the shape of a trapezium.
Badge **B** is in the shape of a rectangle.





All measurements are in centimetres.

The perimeter of badge **A** and the perimeter of badge **B** are equal.

Jake needs to work out the area of badge **A**.
The area of badge **A** is t cm^2.

Work out the value of t.

.....

(Total 6 marks)

9.

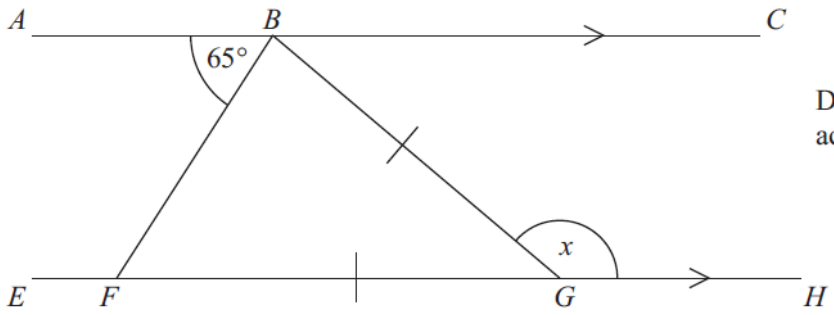


Diagram **NOT** accurately drawn

ABC is parallel to *EFGH*.

GB = *GF*
Angle *ABF* = 65°

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

(Total 4 marks)

10. A circular clock face, centre *O*, has a minute hand *OA* and an hour hand *OB*.
OA = 10 cm.
OB = 7 cm.

Calculate the length of *AB* when the hands show 5 o'clock.
Give your answer correct to 3 significant figures.

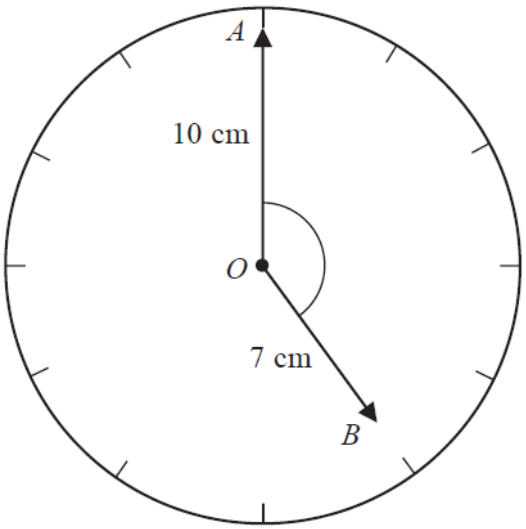


Diagram **NOT** accurately drawn

..... cm

(Total 4 marks)

11. There are 200 workers at a factory.

The cumulative frequency table gives information about their ages.

Age (a years)	**Cumulative frequency**
$0 < a \leq 20$	25
$0 < a \leq 30$	70
$0 < a \leq 40$	138
$0 < a \leq 50$	175
$0 < a \leq 60$	186
$0 < a \leq 70$	194
$0 < a \leq 80$	200

(a) On the grid opposite, draw a cumulative frequency graph for this information.

(2)

(b) Graham says,

"10% of workers at the factory are older than 65"

Is Graham correct?
You must show how you get your answer.

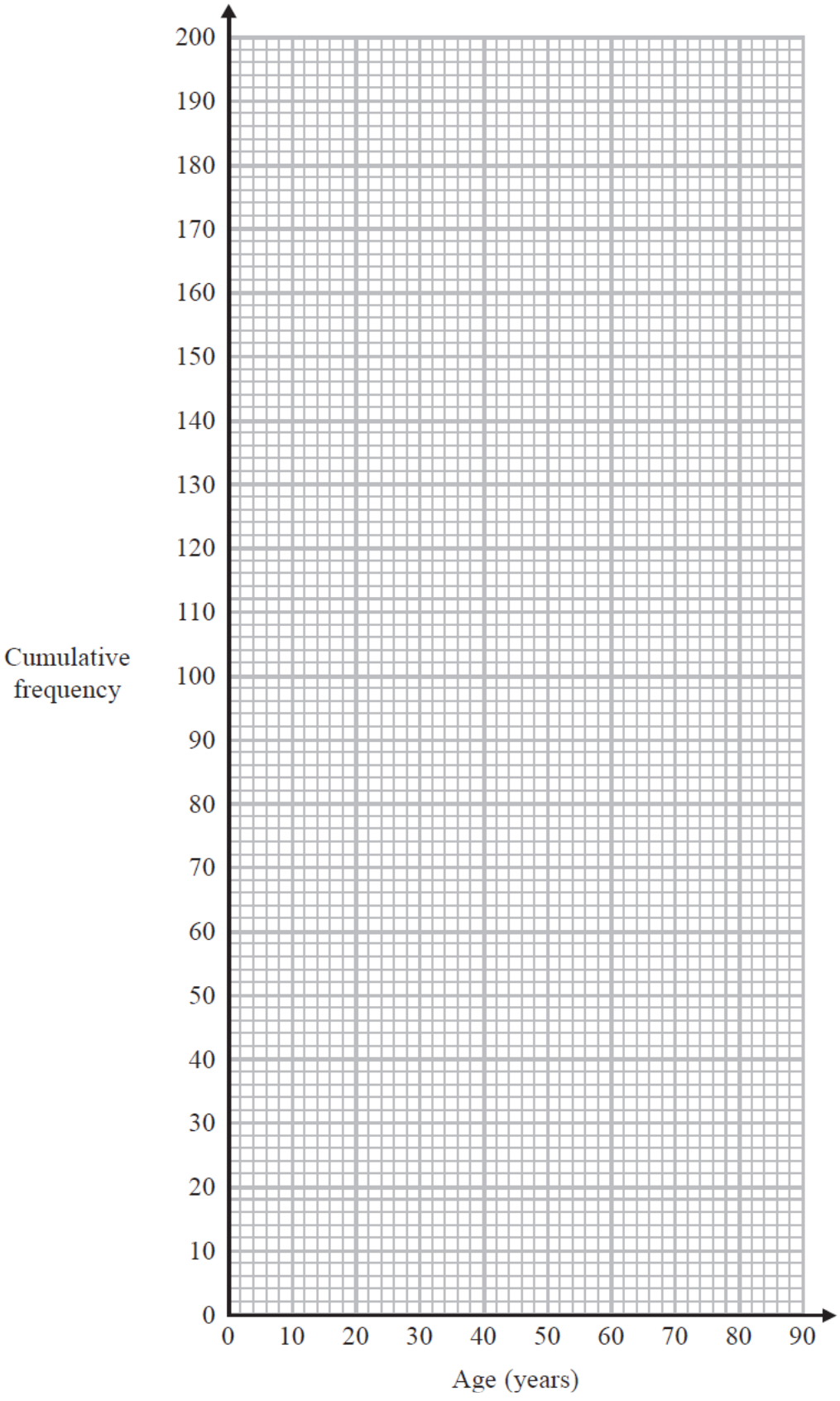
.....

.....

.....

.....

(2)



(Total 4 marks)

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12. When a number is reduced by 30% the answer is 17920
What is the number?

.....

(Total 3 marks)

13. There are only

4 mint biscuits
and 1 toffee biscuit in a tin.

There are only

5 mint sweets
and 3 strawberry sweets in a packet.

Michael's mum lets him take one biscuit from the tin and one sweet from the packet.

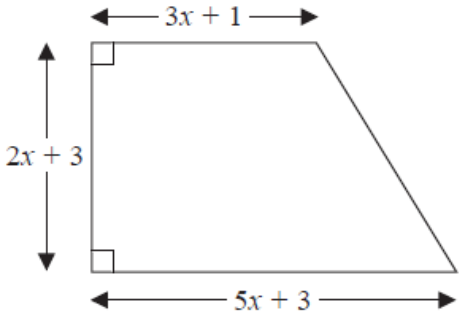
Michael takes a biscuit at random from the tin.
He also takes a sweet at random from the packet.

Work out the probability that either the biscuit is mint or the sweet is mint, but not both.

.....

(Total 3 marks)

14. The diagram shows a trapezium.



All the measurements are in centimetres.
The area of the trapezium is 46 cm^2.

(a) Show that $x^2 + 2x - 5 = 0$

(3)

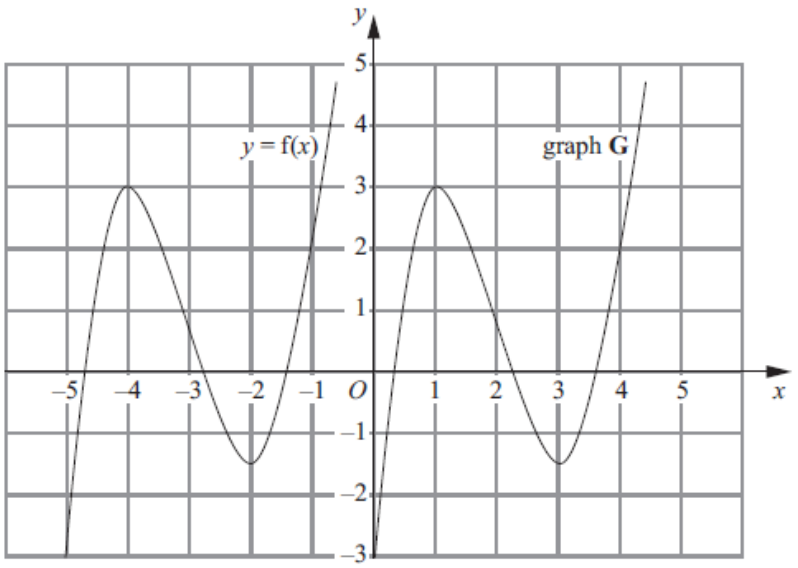
(b) Solve the equation $x^2 + 2x - 5 = 0$
Give your solutions correct to 2 decimal places.

.....

(3)

(Total 6 marks)

15. The graph of $y = f(x)$ is shown on the grid.



The graph **G** is a translation of the graph of $y = f(x)$.

(a) Write down, in terms of f, the equation of graph **G**.

$y =$ .....

(1)

The graph of $y = f(x)$ has a maximum point at $(-4, 3)$.

(b) Write down the coordinates of the maximum point of the graph of $y = f(-x)$.

(..... , ...)

(2)

(Total 3 marks)

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16. $x = 0.0\dot{1}\dot{5}$

Prove algebraically that x can be written as $\frac{1}{66}$

(Total 3 marks)

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17. P is inversely proportional to the square of x.

Given that $x = 5$ when $P = 6$, find the value of P when $x = 8$

Give your answer correct to 2 decimal places.

$P =$ .....

(Total 3 marks)

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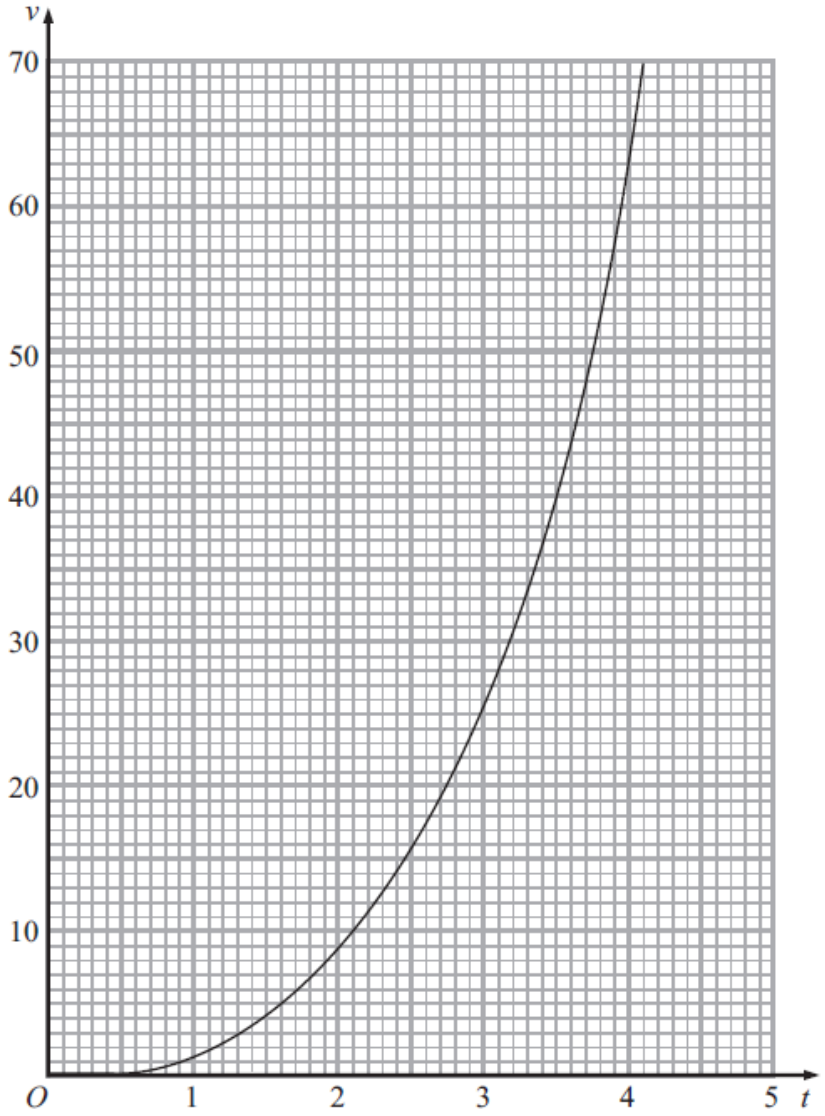
18. The graph shows the velocity, v metres per second, of a rocket at time t seconds.



Find an estimate for the rate of change of the velocity of the rocket at $t = 2$

..... m/s^2

(Total 3 marks)

19. A road is 4530 m long, correct to the nearest 10 metres.
Kirsty drove along the road in 205 seconds, correct to the nearest 5 seconds.

The average speed limit for the road is 80 km/h.

Could Kirsty's average speed have been greater than 80 km/h?
You must show your working.

(Total 5 marks)

20. Here are the first 4 terms of a quadratic sequence.

7 18 33 52

Find an expression, in terms of n, for the nth term of the sequence.

(Total 3 marks)

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21. $g(x) = \dfrac{4x}{3-x}$ $f(x) = 2x - 5$

Given that $x > 3$, find the exact value of x such that $g^{-1}(x) = f(x)$.

(Total 5 marks)

TOTAL FOR PAPER IS 80 MARKS

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