

GCSE Mathematics

Practice Tests: Set 3

Paper 1H (Non-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 not 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.** The equation of a straight line is $y = 4x + 7$

(a) Write down the gradient of the line.

.....
(1)

(b) Write down the y -intercept of the line.

.....
(1)
(Total 2 mark)

-
- 2.** Work out $3\frac{1}{8} - 1\frac{2}{3}$

.....
(Total 3 marks)

3. Here are the ingredients needed to make **8** shortbread biscuits.

Shortbread biscuits makes 8 biscuits 120 g butter 60 g caster sugar 180 g flour
--

Tariq is going to make some shortbread biscuits.
He has the following ingredients

330 g butter

200 g caster sugar

450 g flour

Work out the greatest number of shortbread biscuits that Tariq can make with his ingredients.
You must show all your working.

..... biscuits

(Total 3 marks)

4. Railtickets and Cheaptrains are two websites selling train tickets.

Each of the websites adds a credit card charge and a booking fee to the ticket price.

Railtickets

Credit card charge: 2.25% of ticket price

Booking fee: 80 pence

Cheaptrains

Credit card charge: 1.5% of ticket price

Booking fee: £1.90

Nadia wants to buy a train ticket.

The ticket price is £60 on each website.

Nadia will pay by credit card.

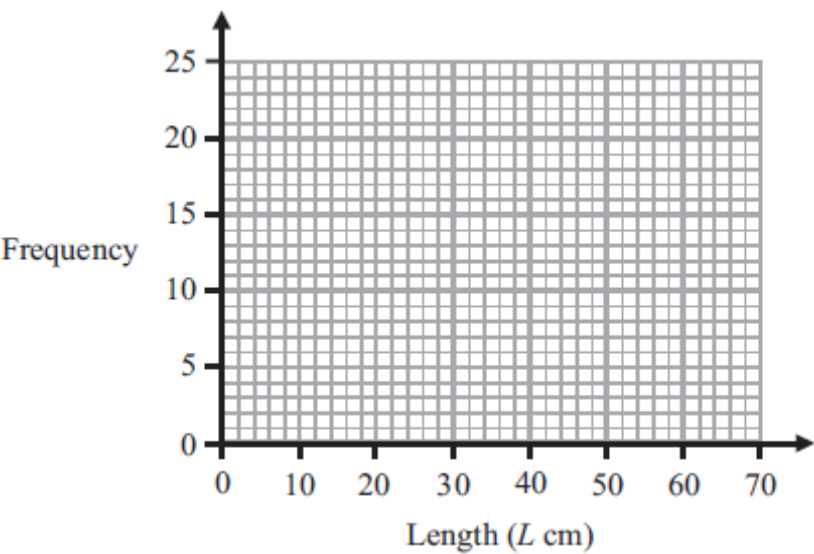
Will it be cheaper for Nadia to buy the train ticket from Railtickets or from Cheaptrains?

(Total 4 marks)

5. The table gives information about the lengths of the branches on a bush.

Length(<i>L</i> cm)	Frequency
$0 \leq L < 10$	20
$10 \leq L < 20$	12
$20 \leq L < 30$	10
$30 \leq L < 40$	8
$40 \leq L < 50$	6
$50 \leq L < 60$	0

(a) Draw a frequency polygon to show this information.



(2)

(b) Work out the total number of branches on the bush.

.....

(2)

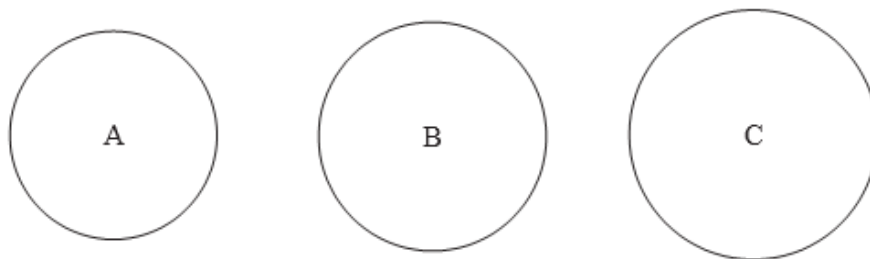
(c) Write down the modal class interval.

.....

(1)

(Total 5 marks)

6. Here are three circles A, B and C.



Diagrams **NOT**
accurately drawn

The area of circle A is 200 cm^2 .

The area of circle B is 10% larger than the area of circle A.

The area of circle C is 10% larger than the area of circle B.

How much larger is the area of circle C than the area of circle A?

(Total 4 marks)

7. (a) Expand and simplify $2(x + 3y) + 4(x - y)$

.....

(2)

- (b) Factorise completely $8p - 12pq$

.....

(2)

(Total 4 marks)

8. The diagram shows a triangle.

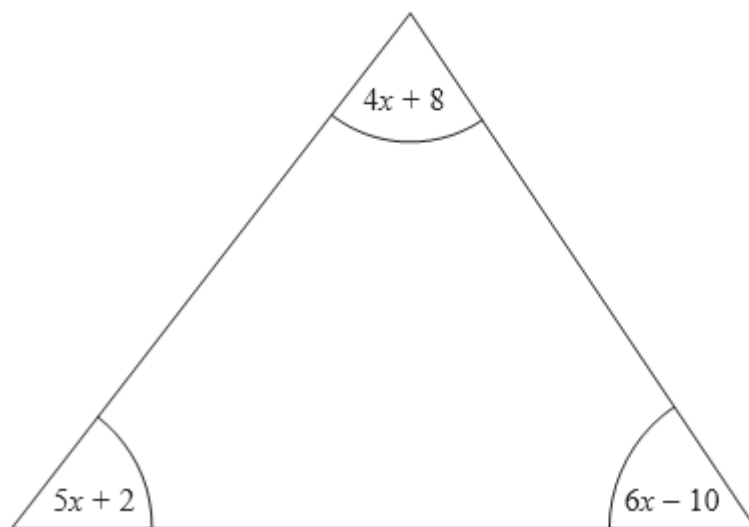


Diagram **NOT**
accurately drawn

All the angles are measured in degrees.

Show that the triangle is isosceles.

(Total 5 marks)

9. (a) Find the Highest Common Factor (HCF) of 30 and 42.

.....
(2)

- (b) Find the Lowest Common Multiple (LCM) of 30 and 45.

.....
(2)

(Total 4 marks)

10.

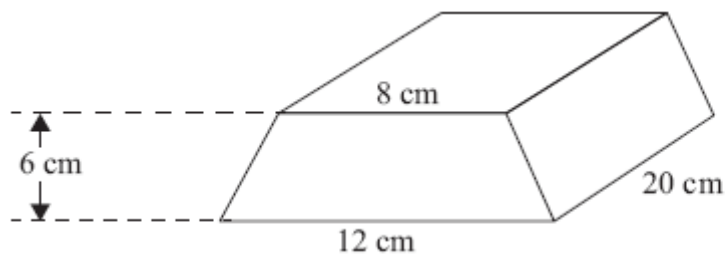


Diagram NOT
accurately drawn

The diagram shows a solid prism made from metal.
The cross-section of the prism is a trapezium.

The parallel sides of the trapezium are 8 cm and 12 cm.
The height of the trapezium is 6 cm.
The length of the prism is 20 cm.

The density of the metal is 5 g/cm^3 .

Calculate the mass of the prism.
Give your answer in kilograms.

..... kg

(Total 5 marks)

11. (a) Write down the value of 25^0

.....
(1)

(b) Write down the value of $49^{-\frac{1}{2}}$

.....
(1)

(c) Write as a power of 2 $\frac{4 \times 8}{16^3}$

.....
(3)

(Total 5 marks)

12. There are 9 counters in a box.

4 of the counters are red.

2 of the counters are blue.

3 of the counters are yellow.

Pavinder takes at random two counters from the box.

Work out the probability that he takes at least one yellow counter.

.....
(Total 4 marks)

13. Simplify fully $\frac{2x^2 - 7x + 3}{x^2 - 9}$

.....
(Total 3 marks)

14. Work out $(2 + \sqrt{3})(2 - \sqrt{3})$
Give your answer in its simplest form.

.....
(Total 2 marks)

15.

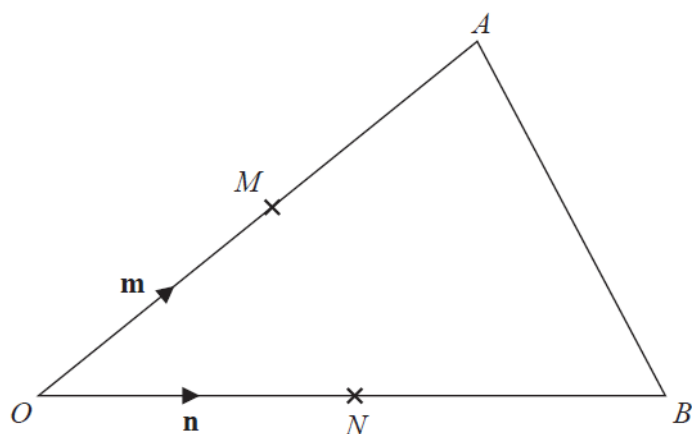


Diagram **NOT**
accurately drawn

OAB is a triangle.

M is the midpoint of OA .

N is the midpoint of OB .

$$\overrightarrow{OM} = \mathbf{m}$$

$$\overrightarrow{ON} = \mathbf{n}$$

Show that AB is parallel to MN .

(Total 3 marks)

16.

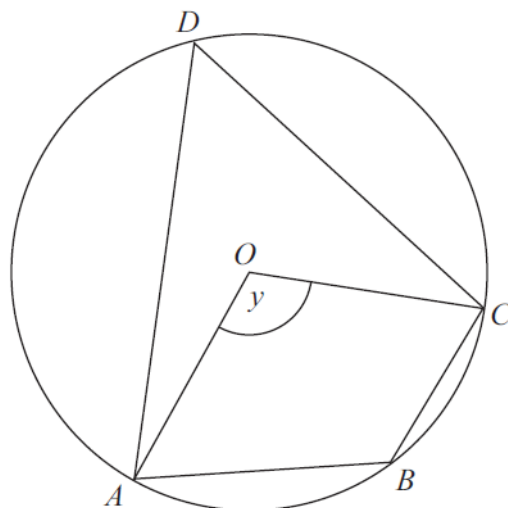


Diagram **NOT**
accurately drawn

A, B, C and D are points on the circumference of a circle, centre O .

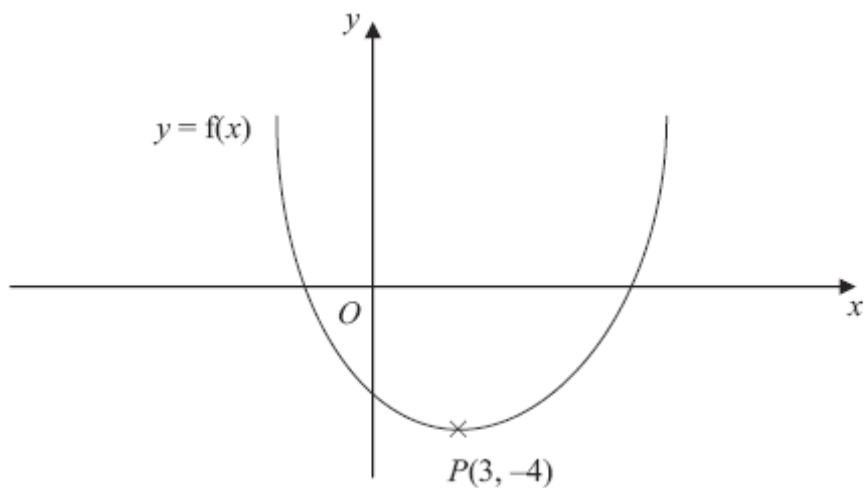
Angle $AOC = y$.

Find the size of angle ABC in terms of y .

Give a reason for each stage of your working.

(Total 4 marks)

17. This is a sketch of the curve with the equation $y = f(x)$.
The only minimum point of the curve is at $P(3, -4)$.



- (a) Write down the coordinates of the minimum point of the curve with the equation $y = f(x - 2)$.

(..... ,)

(2)

- (b) Write down the coordinates of the minimum point of the curve with the equation $y = f(x + 5) + 6$

(..... ,)

(2)

(Total 4 marks)

18.

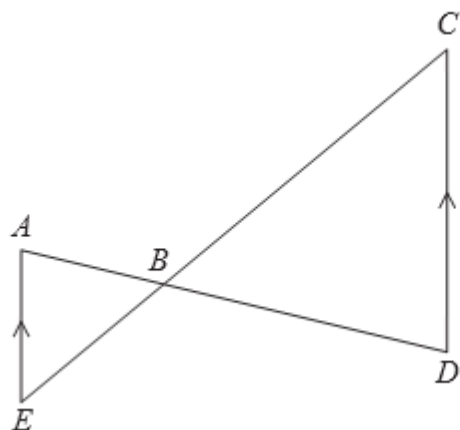


Diagram **NOT**
accurately drawn

AE is parallel to CD .

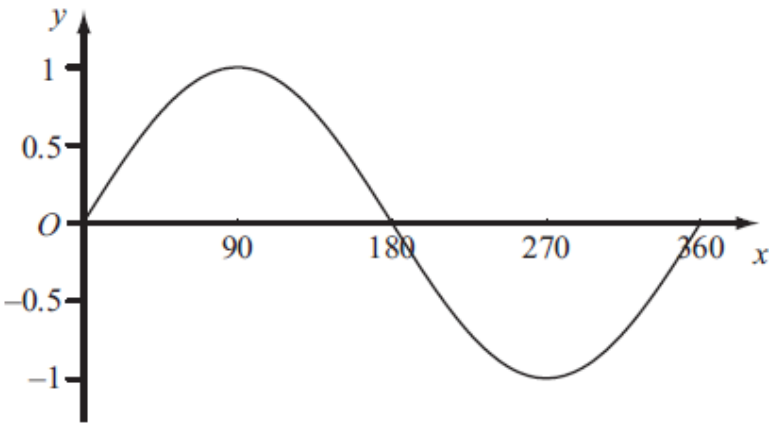
ABD and EBC are straight lines.

Prove that triangle ABE is similar to triangle DBC .

Give reasons for each stage of your proof.

(Total 4 marks)

19. The diagram shows a sketch of the curve $y = \sin x^\circ$ for $0 \leq x \leq 360$



The exact value of $\sin 60^\circ = \frac{\sqrt{3}}{2}$

(a) Write down the exact value of

(i) $\sin 120^\circ$,

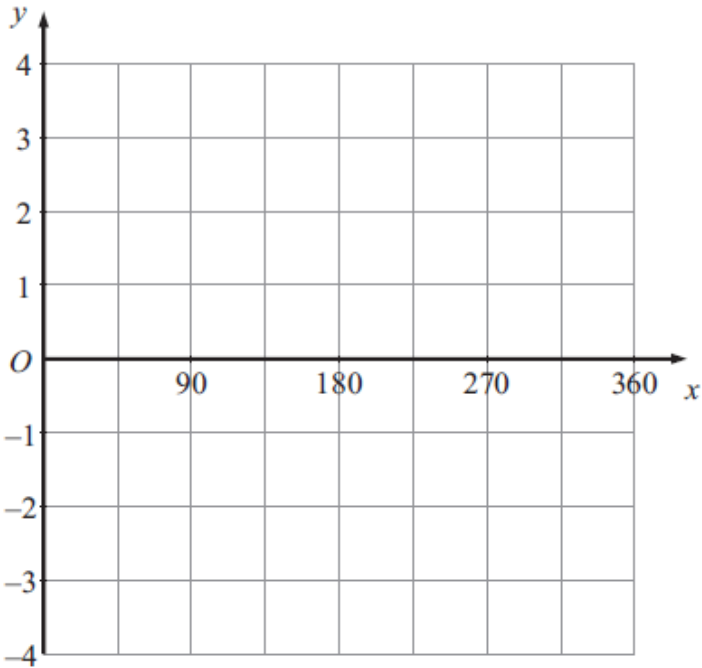
.....

(ii) $\sin 240^\circ$.

.....

(2)

(b) On the grid below, sketch the graph of $y = \sin 2x^\circ$ for $0 \leq x \leq 360$



(2)

(Total 4 marks)

- 20.** Prove algebraically that the difference between the squares of any two consecutive integers is equal to the sum of these two integers.

(Total 4 marks)

- 21** Sketch the graph of $f(x) = -x^2 - 3x + 5$, showing the coordinates of the turning point and the coordinates of any intercepts with the coordinate axes.

(Total 4 mark)

TOTAL FOR PAPER IS 80 MARKS