

ELGIN ACADEMY

Prelim Examination 2005 / 06

MATHEMATICS

National Qualifications - Intermediate 1

Maths Units 1, 2 and 3

Paper 2

Time allowed - 55 minutes

Fill in these boxes and read carefully what is printed below

Full name of centre

Town

Forename(s)

Surname

Date of birth

Day Month Year

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Candidate number

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Seat number

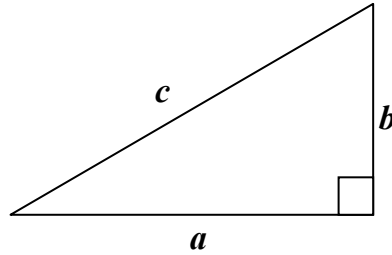
1. You may use a calculator.
2. Write your working in the spaces provided.
3. Full credit will be given only where the solution contains appropriate working.

FORMULAE LIST

Circumference of a circle: $C = \pi d$

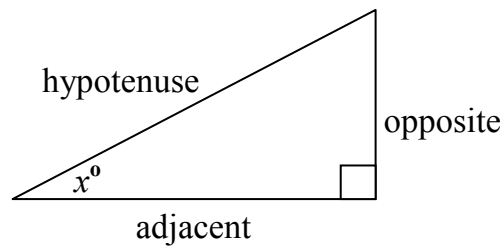
Area of a circle: $A = \pi r^2$

Theorem of Pythagoras:



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

Trigonometric ratios in a right angled triangle:



$$\tan x^\circ = \frac{\text{opposite}}{\text{adjacent}}$$

$$\sin x^\circ = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\cos x^\circ = \frac{\text{adjacent}}{\text{hypotenuse}}$$

All questions should be attempted

- 1. Stewart pays £15 per month for his broadband internet connection. The internet company have just informed him that the charge is going to increase by 7%.

How much will Stewart have to pay for his internet connection after the increase?

3

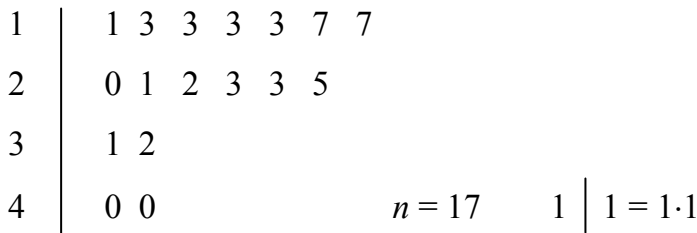
- 2. The force, F , needed to stop a train traveling at a speed, v m/s, within a stopping distance, s m, is given by the formula:

$$F = \frac{120v^2}{s}$$

Find the force that would stop a train traveling at 24 m/s in 400 m.

3

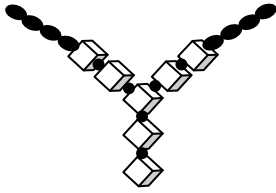
- 3. The stem and leaf diagram below shows the engine sizes of a group of cars in a car park.



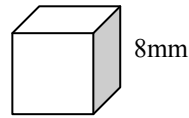
Use the diagram to write down the median and range of the data.

2

4. Elaine is designing some jewellery for her final project at Art College. She is making a necklace with has some silver cubes as part of the design.



The cubes she is using all have 8mm sides.



- (a) Calculate the volume of one of the small silver cubes.

2

- (b) The silver is supplied as a cuboid 20mm by 15mm by 30mm, which is melted down to form the cubes.

How many complete cubes could she make out of her silver cuboid?

3

5. Arthur is going on holiday and has to be at the airport, 180km from home, by 11.30am. What time would he have to leave home if he travels at 80km/h?

4

6. The Munro family have had a new kitchen installed. The kitchen company offered them two ways of paying for it.

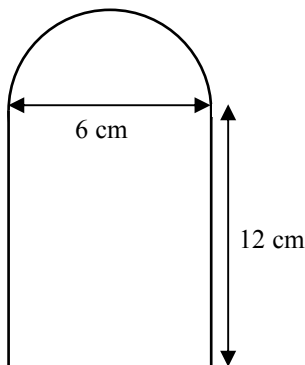
Option 1: £1000 deposit and then 24 payments of £190

Option 2: 36 payments of £140 then pay the remaining balance in one payment.

If both options cost the same, calculate how much would still have to be paid after 36 months with Option 2.

4

7.



The side of a box of toiletries is in the shape of a rectangle and a semi-circle.

Calculate the area of the side.

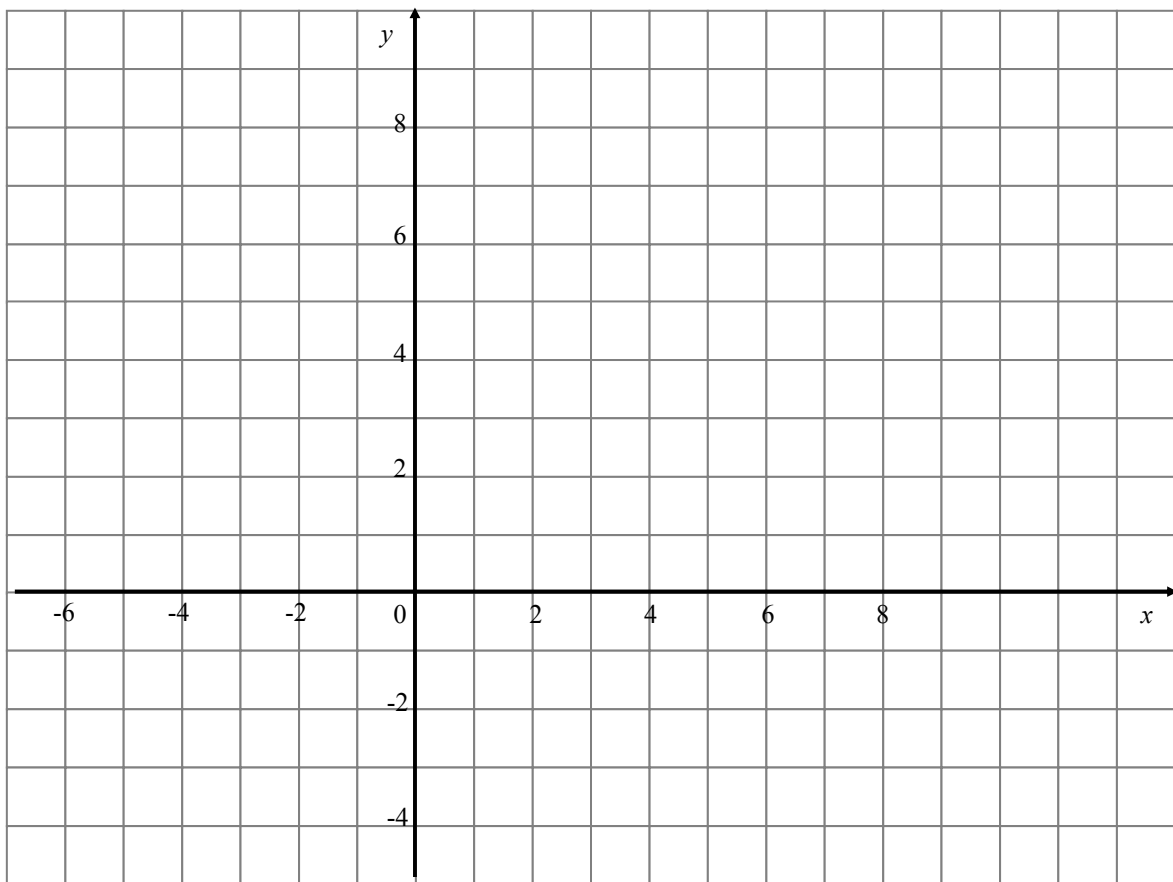
4

8. (a) Complete the table of values for $y = \frac{1}{2}x - 3$.

x	-2	2	6
y			

2

(b) Draw the graph of $y = \frac{1}{2}x - 3$ on the grid below.



2

(c) Write down the coordinates of the point where the line crosses the y -axis.

1

9. When a new book was launched last year, 72 560 copies were sold in the first hour that the shops were open.

(a) Write this number in standard form?

2

(b) If sales remained steady at this rate, how many copies of the book were sold in the first 12 hours after the launch? Give your answer to the nearest 1000.

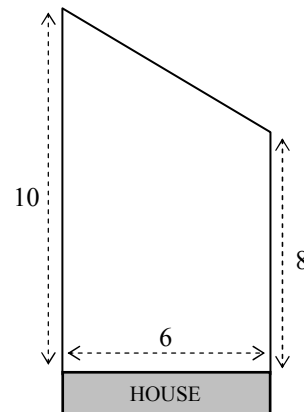
3

10. Gillian’s lawn is shaped as in the diagram. All lengths are in metres.

Gillian is going to put a decorative border round her lawn. **The border does not go along the side of the house.**

The border is sold in 2 metre lengths and costs £4.95 a length.

Calculate how much it would cost Gillian to put the border round her lawn.



5

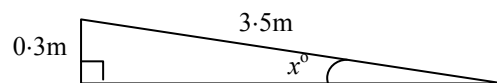
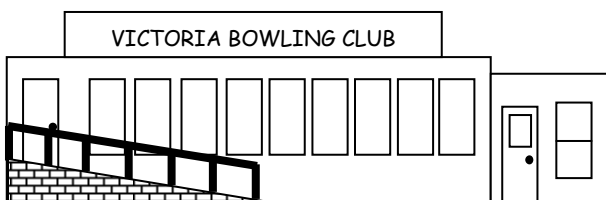
11. Ciara recorded the number of e-mails she sent over 80 days.

Number of e-mails	Frequency	Number of e-mails × frequency
5	1	
6	2	
7	4	
8	13	
9	22	
10	13	
11	9	
12	6	
13	6	
14	4	

Complete the table above and calculate the mean number of e-mails Ciara sent per day.

3

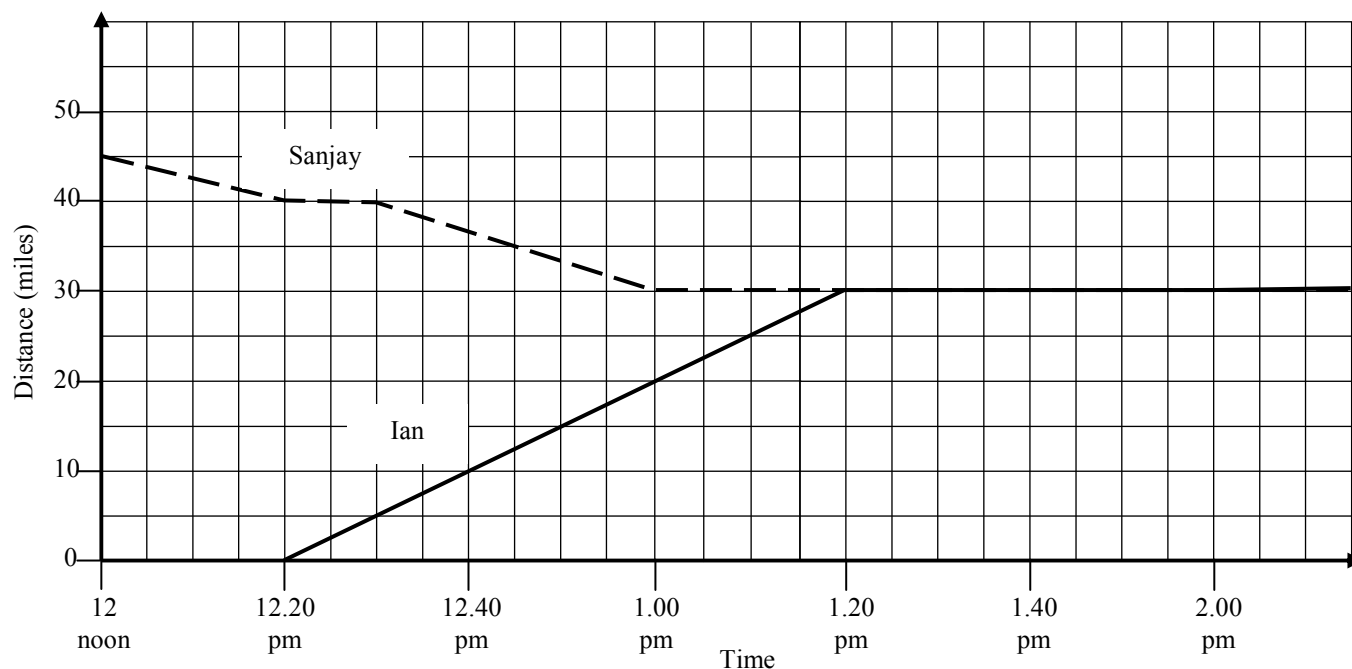
12. A ramp has been constructed at a bowling club. It is 3.5metres long and rises through 0.3metres.



Calculate the angle, x° , that the ramp makes with the horizontal.

4

13. Ian and Sanjay are friends but live in towns a number of miles apart. They met up one Saturday for lunch. The graph below shows their journeys.



(a) How far apart do the two men live?

1

(b) Who arrived at the meeting place first?

1

(c) How long did he have to wait for the other?

1

(d) What was Ian's speed for his journey?

1

END OF QUESTION PAPER