

# ELGIN ACADEMY

*Prelim Examination 2006 / 07*

<p><b>MATHEMATICS</b> <b>National Qualifications - Intermediate 1</b> <b>Maths Units 1, 2 and 3</b> <b>Paper 2</b></p>
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**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**

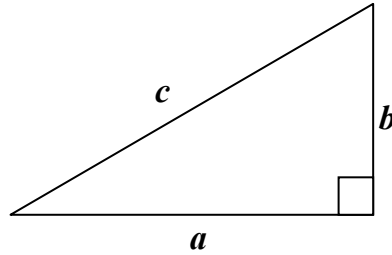
- 1. You may use a calculator.**
- 2. Write your working in the spaces provided.**
- 3. Full credit will be given only where the solution contains appropriate working.**

## FORMULAE LIST

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

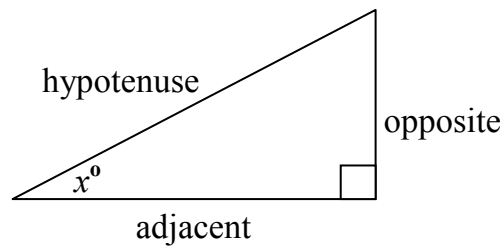
Area of a circle:  $A = \pi r^2$

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. The number of text messages sent from Claire’s mobile phone was recorded over a period of 21 days. The results are shown in the table:

6	8	5	6	7	7	6
6	9	10	6	5	6	8
10	5	8	6	9	9	10

- (a) Complete this frequency table for the above data.

Number of messages	Tally marks	Frequency
5		
6		
7		
8		
9		
10		

- (b) One day is chosen. What is the probability that Claire had sent 7 messages that day?

2

2

2. Siobhan saw these two adverts for the same computer package.

<p>COMPUTERS 'R' US</p> <p>£875</p> <p>VAT INCLUDED</p>
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<p>COMPUTERS 4 U</p> <p>£750</p> <p>+ 17.5% VAT</p>
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Which shop is offering the best deal? Give a reason for your answer.

3

3. There are  $8.64 \times 10^4$  seconds in a day.

How many seconds are there in the month of June? Give your answer in standard form.

3

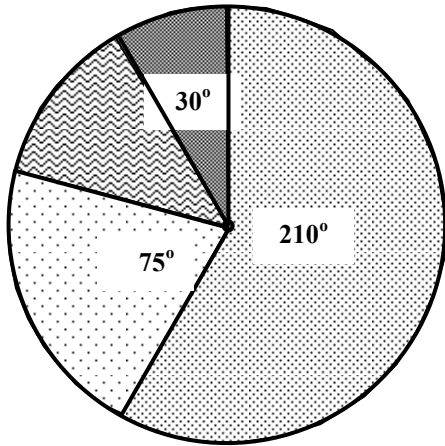
4. A ring valued at £1500 has to be insured with the Jewelrite Insurers.



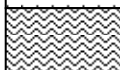

The premium is £3.50 for each £100 of value.

How much would it cost to insure the ring?

2

5. Some workers in a call centre attended a Health screening. The pie chart illustrates the information obtained about their smoking habits.



	Non-smokers
	Smokers
	Smokers who want to give up
	Ex-smokers

If 320 workers attended the health day, how many of them were smokers who wanted to give up?

3

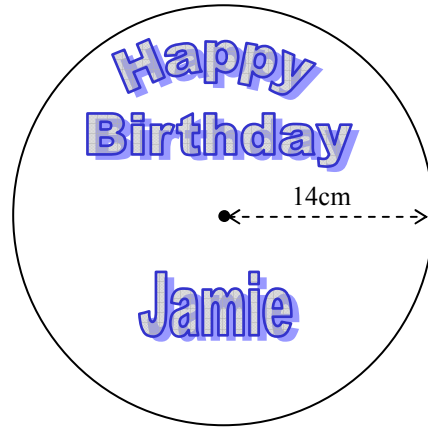
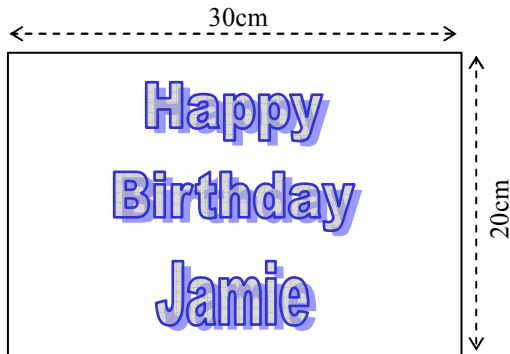
6. Solve, algebraically, the equation

$$7m - 4 = 11 + 4m$$

3

7. Mr Bun, the baker, sells birthday cakes in two shapes.

One is rectangular and measures 20cm by 30cm and the other is circular with a radius of 14cm.



Both cakes have the same depth and cost £4.99 each.

Which cake gives the best value for money?

You must show all your working and give a reason for your answer.

8. Solve, algebraically, the inequation

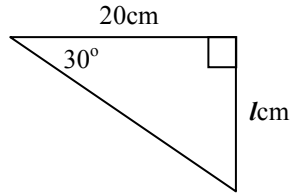
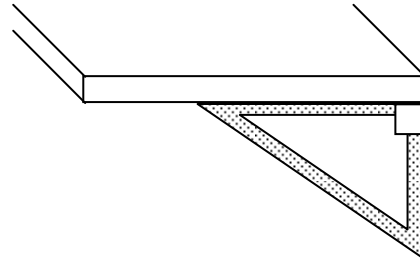
$$5f - 7 \leq 28$$

4

2

9. A triangular bracket is designed to support a shelf.

Its width is 20cm and it makes an angle of  $30^\circ$  with the horizontal shelf.



Calculate the length,  $l$ cm, of the bracket.

10. Evaluate the formula

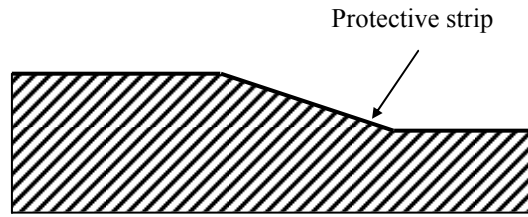
$$W = \frac{10\sqrt{P}}{4d}$$

when  $P = 2.56$  and  $d = 0.4$ .

3

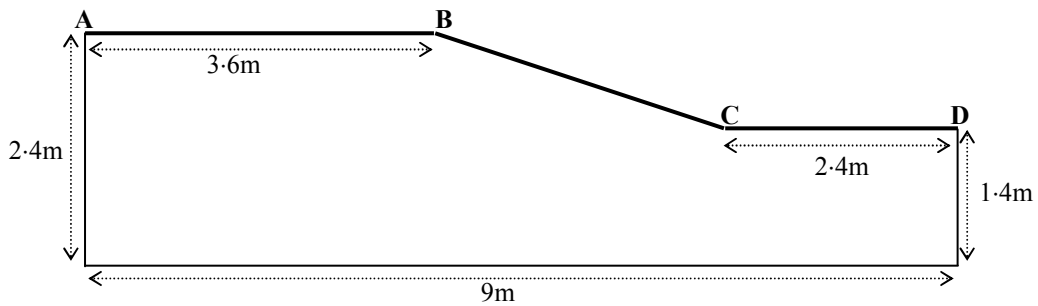
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11. *Diagram 1* shows a section of a garden fence. It has a protective strip along the top.



*Diagram 1*

The dimensions of the fence are shown in *Diagram 2*.



*Diagram 2*

Calculate the total length of protective strip that would be required for this section of fence.  
(i.e. the total distance from A to B to C to D).

5

12. The path round a country park is 5 miles. Maya and Emily walked round it at an average speed of 4 miles per hour.

Jonathan and Gregor cycled round it in 40 minutes.

What was the difference in their times?

4

13. One day there were 1350 pupils in a school.

1240 pupils were wearing school uniform.

What percentage of the pupils were wearing school uniform? Give your answer correct to 1 decimal place.

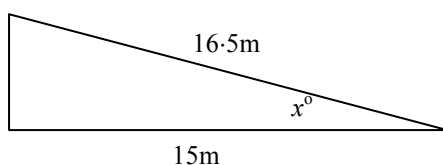
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14. Blair works a basic 30 hours per week in a Health Club. He is paid £5.70 per hour for his basic hours and double time for overtime.

One week Blair was paid £330.60. How many hours of overtime did he work?

4

15. A skateboard ramp has been designed to have the following dimensions.



The ramp can only be used in competitions if the angle,  $x^\circ$ , is between 24 and 26 degrees.

Can this ramp be used in a competition? You must show all working and give a reason for your answer.

3

***END OF QUESTION PAPER***