

# ELGIN ACADEMY

*Prelim Examination 2006 / 2007*

## MATHEMATICS Standard Grade - General Level Paper I

**Time Allowed - 35 minutes**

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First name and initials

Surname

Class

Teacher

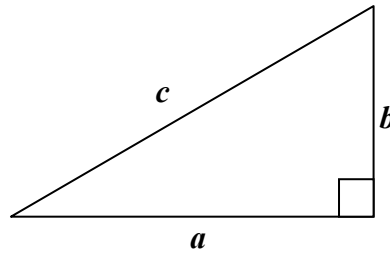
Read Carefully

1. Answer as many questions as you can.
2. Write your answers in the spaces provided .
3. Full credit will be given only where the solution contains appropriate working.
4. **You may not use a calculator**

## FORMULAE LIST

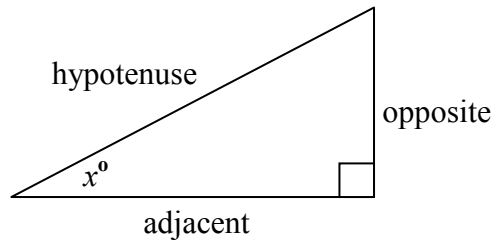
Circumference of a circle:	$C = \pi d$
Area of a circle:	$A = \pi r^2$
Curved surface area of a cylinder:	$A = 2\pi r h$
Volume of a cylinder:	$V = \pi r^2 h$
Volume of a triangular prism:	$V = Ah$

Theorem of Pythagoras:



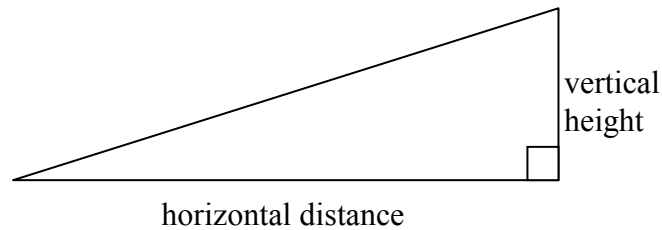
$$a^2 + b^2 = c^2$$

Trigonometrical ratios  
in a right angled  
triangle:



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

Gradient:



$$\text{Gradient} = \frac{\text{vertical height}}{\text{horizontal distance}}$$

1. Carry out the following calculations.

(a)  $5.65 + 8.9 - 6.8$

(1)

(b)  $102.4 \div 400$

(1)

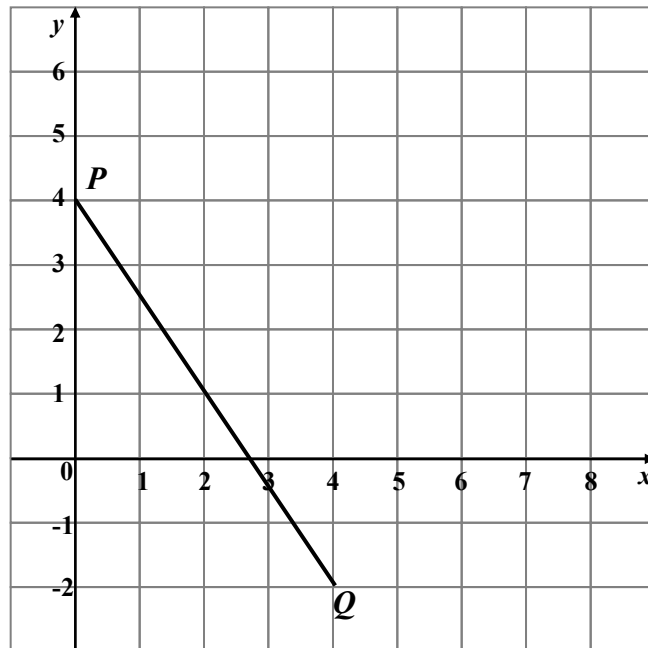
(c)  $17.8 \times 6000$

(1)

(d) 40% of £42

(2)

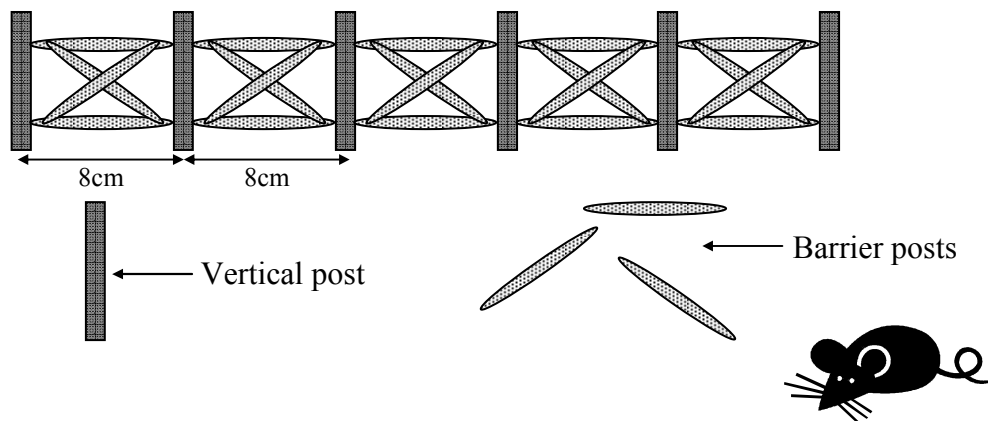
2. The line  $PQ$  is drawn on the grid below.



Calculate the gradient of the line  $PQ$ .

(2)

3. Rachel plans to build a pen for her pet mouse. She decides to create a fence using counting rods as her vertical posts and lollipop sticks as her barrier posts, as shown below.



(a) Complete the table below.

Number of vertical posts ( $v$ )	2	3	4	5
Number of barrier posts ( $b$ )		8		

(2)

(b) Write down a formula for calculating the number of barrier posts ( $b$ ), when you know the number of vertical posts ( $v$ ).

(2)

(c) Each section of fencing is 8cm long, as shown in the diagram above, and Rachel reckons she will need a fence 240cm long.

(i) How many vertical posts will she need?

(1)

(ii) How many barrier posts will she need?

(2)

		KU	RE										
<p>4. The final cost of building the new Scottish Parliament was £431 million.</p> <p>Write this amount in scientific notation.</p>													
	(2)												
<p>5. The local television repair shop kept a record of all the repairs they carried out over 4 weeks.</p> <p>The results are shown in the table.</p> <p>The manager carried out a random check of the repairs.</p> <p>(a) What is the probability that the first repair he chose was a television one?</p> <table border="1" data-bbox="780 692 1197 1088"> <thead> <tr> <th>Item to be repaired.</th> <th>Number of items.</th> </tr> </thead> <tbody> <tr> <td>Television</td> <td>24</td> </tr> <tr> <td>Video</td> <td>4</td> </tr> <tr> <td>D.V.D.</td> <td>34</td> </tr> <tr> <td>Digital Box</td> <td>18</td> </tr> </tbody> </table>	Item to be repaired.	Number of items.	Television	24	Video	4	D.V.D.	34	Digital Box	18			
	Item to be repaired.	Number of items.											
	Television	24											
Video	4												
D.V.D.	34												
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(2)													
<p>(b) Due to the very small number of video repairs that come into the shop the manager decided to remove this service from his repair list.</p> <p>Based on the above information, what is the probability that the next repair will be to a digital box?</p>													
	(2)												

6.



The local swimming club held a diving competition where 15 males, aged 12 to 14, participated. Each dive was marked out of 10 and the results are shown below.

6·2, 5·7, 7·8, 6·2, 9·5, 7·7, 7·8, 8·3, 4·9, 7·7, 8·4, 6·2, 7·9, 9·8, 5·5

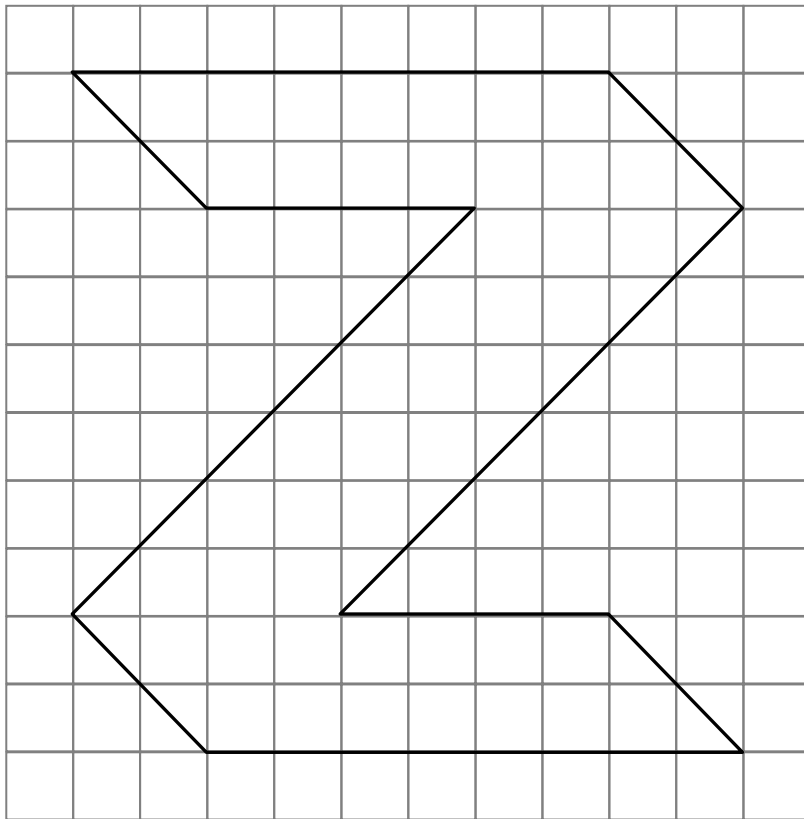
(a) Display these results in an ordered stem-and-leaf diagram.

(b) What was the modal score?

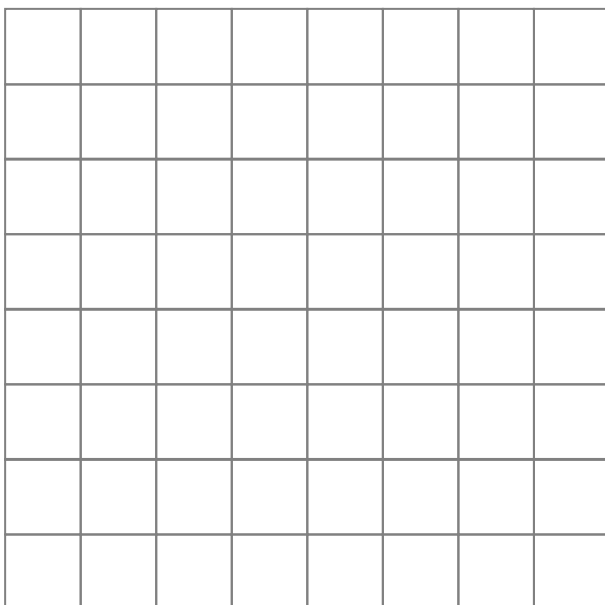
(c) What was the median score?

KU	RE
(3)	
(1)	
(1)	

7. The letter Z is shown in the diagram.



Using the grid below, draw a reduction of this letter Z using a scale factor of  $\frac{1}{2}$ .



KU RE

(3)

	KU	RE
<p><b>8.</b> Mr and Mrs Fit ran the Glasgow Marathon last year.</p> <p>They both set out at 1225.</p> <p>Mr Fit achieved a personal best when he ran the race in 3 hours 46 minutes. Mrs Fit arrived at the finish line 47 minutes after her husband.</p> <p>Calculate the time at which Mrs Fit crossed the finish line.</p>		
<b>(4)</b>		

***END OF QUESTION PAPER***