

ELGIN ACADEMY

Prelim Examination 2006 / 2007

MATHEMATICS Standard Grade - General Level Paper II

Time Allowed - 55 minutes

First name and initials

Surname

Class

Teacher

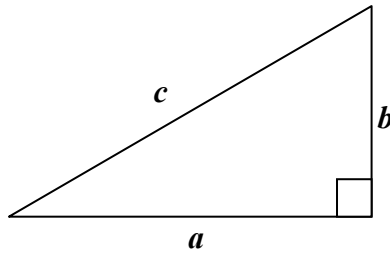
Read Carefully

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 use a calculator**

FORMULAE LIST

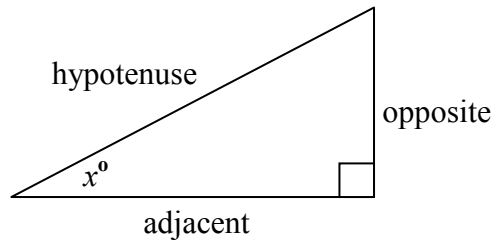
Circumference of a circle:	$C = \pi d$
Area of a circle:	$A = \pi r^2$
Curved surface area of a cylinder:	$A = 2\pi r h$
Volume of a cylinder:	$V = \pi r^2 h$
Volume of a triangular prism:	$V = Ah$

Theorem of Pythagoras:



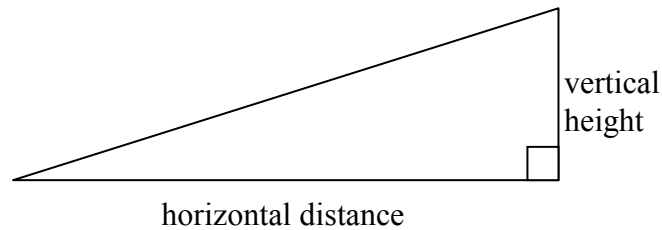
$$a^2 + b^2 = c^2$$

Trigonometrical ratios
in a right angled
triangle:



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

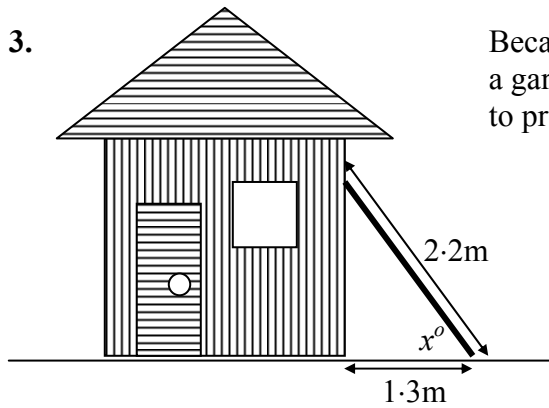
Gradient:



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

	KU	RE																		
<p>1. Rosie is saving to buy a new bike. She plans to save £8 per week from her paper round. To encourage Rosie, her dad promises to give her 14% of the total amount she saves. If Rosie sticks to her plan for 12 weeks, calculate the total amount she will have to buy a bike.</p>																				
<p>2. Mr and Mrs Harper and their two children, aged 8 years and 14 years are going on holiday to Florida in June. They plan to spend one week at a beach resort and 5 days visiting theme parks. They have set aside £1000 to cover the entrance fees to the theme parks.</p> <table border="1" data-bbox="225 1077 1187 1559"> <thead> <tr> <th></th> <th><i>Adult 1 day pass</i></th> <th><i>Child 1 day pass (4 – 12 years)</i></th> </tr> </thead> <tbody> <tr> <td>Welt Disney World</td> <td>\$124</td> <td>\$103</td> </tr> <tr> <td>Undersea World</td> <td>\$70</td> <td>\$57</td> </tr> <tr> <td>Space Centre</td> <td>\$80</td> <td>\$57</td> </tr> <tr> <td>Universel Studios</td> <td>\$59</td> <td>\$50</td> </tr> <tr> <td>Swim with Dolphins</td> <td>\$130</td> <td>\$100</td> </tr> </tbody> </table> <p>If £1 = \$1.859, determine whether they can visit all of the parks in the above table.</p>		<i>Adult 1 day pass</i>	<i>Child 1 day pass (4 – 12 years)</i>	Welt Disney World	\$124	\$103	Undersea World	\$70	\$57	Space Centre	\$80	\$57	Universel Studios	\$59	\$50	Swim with Dolphins	\$130	\$100	(4)	
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3.



Because of structural damage caused by high winds, a garden shed has to be propped up by a length of wood to prevent it falling over.

The prop is 2.2 m long.

The foot of the prop is 1.3m from the shed.

Calculate the size of the angle, x° , that the prop makes with the ground.

KU	RE
(4)	
(2)	
(3)	

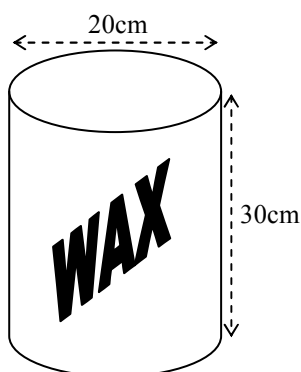
4. (a) Factorise

$$12x - 18y$$

(b) Solve algebraically

$$3(2x - 3) = 81$$

7. Wax used in candle making comes in large cylindrical blocks with **diameter** 20cm and height 30cm as shown in the diagram below.



The volume of wax remains the same when the wax is melted down and used to make candles in other shapes.

If the cylinder of wax above is melted down and used to make small candle cubes with side 5cm, how many **complete** candle cubes can be made from this amount of wax?

(5)

8. The Shek family are holidaying in Britain and decide to hire a car for one week.
The car hire firm offers two different packages for the car they wish to hire.

<p>Close2home</p> <p>£105 per week plus 5p per mile</p>

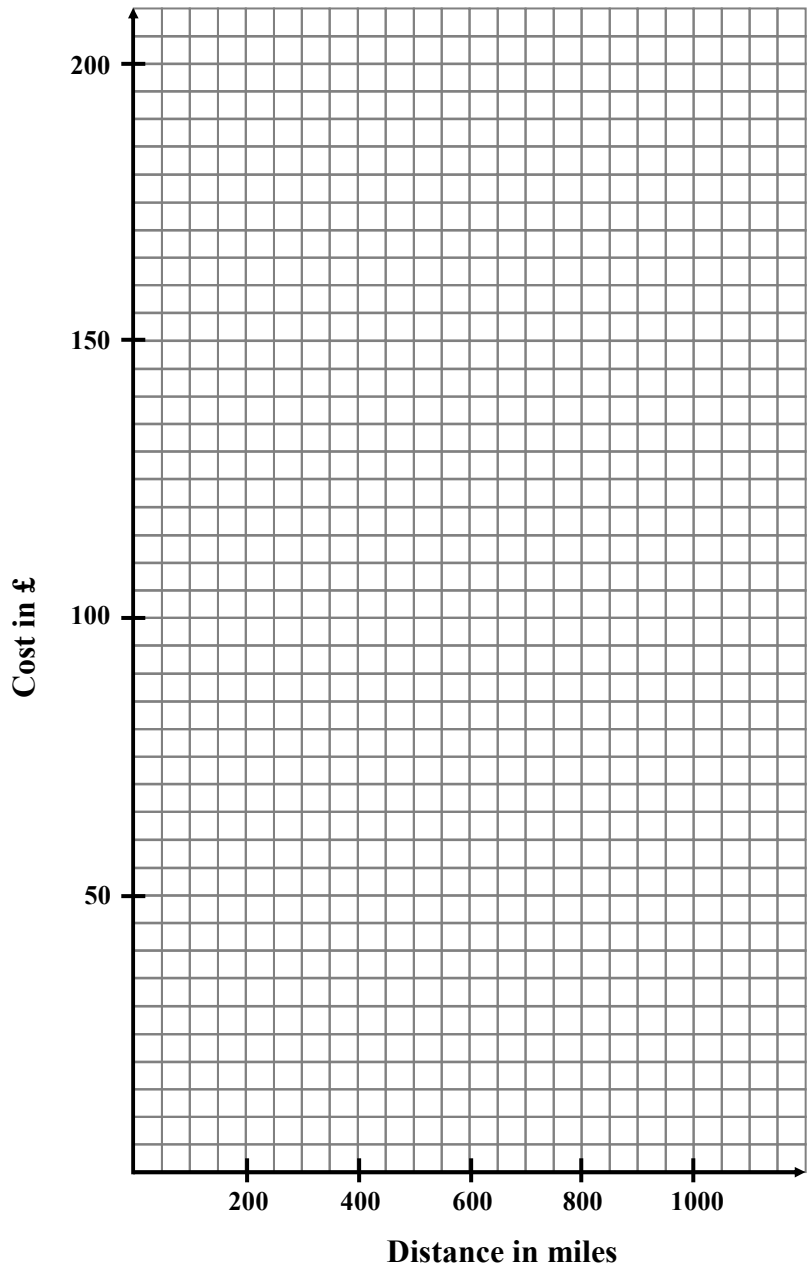
<p>Lottomiles</p> <p>£75 per week plus 10p per mile</p>

- (a) Complete the table to show the costs for the distances given.

Number of miles	200	400	600	800	1000
Close2home (£)					
Lottomiles (£)					

(3)

8. (b) (i) On the grid below draw a graph to show the cost of hiring through the **Lottomiles** scheme.
- (ii) On the same grid draw a graph showing the **Close2home** costs.



- (c) Mr Shek plans on driving 150 miles **per day**. Which scheme should Mr Shek choose, and why?

(2)	
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	(2)
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		KU	RE
<p>9. The operation Ψ means ‘double the first number then multiply by the square of the second number’.</p> <p>For example: $3 \Psi 4 = 2(3) \times 4^2 = 6 \times 16 = 96$</p> <p>(a) Calculate $5 \Psi 3$.</p>			
	(2)		
<p>(b) If $x \Psi 3 = 54$, find x.</p>			
	(3)		
<p>10. Sam and Leah plan to run from Buckie to Cullen. Sam follows the main road and covers 12km at a speed of 6.4km per hour. Leah runs cross country and covers 9.5km at a speed of 5km per hour .</p> <p>They both set off at the same time. Who arrives in Cullen first and by how many minutes and seconds?</p>			
	(5)		

END OF QUESTION PAPER