

ELGIN ACADEMY

Prelim Examination 2007 / 2008

MATHEMATICS Standard Grade - General Level Paper 2

Time Allowed - 55 minutes

First name and initials

Surname

Class

Teacher

Date:

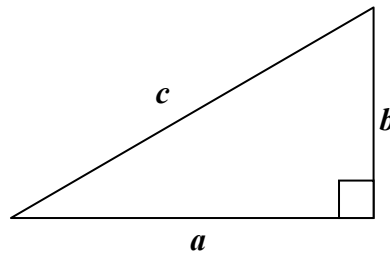
Read Carefully

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

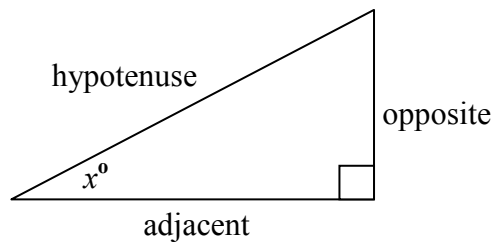
Circumference of a circle:	$C = \pi d$
Area of a circle:	$A = \pi r^2$
Curved surface area of a cylinder:	$A = 2\pi r h$
Volume of a cylinder:	$V = \pi r^2 h$
Volume of a triangular prism:	$V = Ah$

Theorem of Pythagoras:



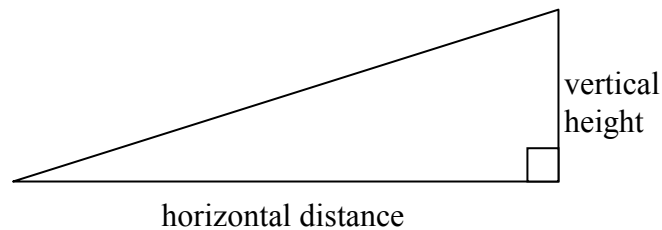
$$a^2 + b^2 = c^2$$

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. Fraser wants to buy a new car priced at £6 500. The car salesperson informs him of the three different methods to buy the car.</p> <div style="display: flex; justify-content: space-around; margin: 10px 0;"> <div style="border: 3px double black; padding: 5px; width: 25%;"> <p>1. Pay cash. Receive 6% discount.</p> </div> <div style="border: 3px double black; padding: 5px; width: 25%;"> <p>2. Borrow £6 500 from a bank. Pay it back over three years at £215 per month.</p> </div> <div style="border: 3px double black; padding: 5px; width: 25%;"> <p>3. Buy it on Hire Purchase. Deposit of 15% of the car price followed by 24 monthly payments of £265.</p> </div> </div> <p>(a) How much would it cost him if he paid cash?</p> <p style="text-align: right;">(2)</p> <p>(b) His girlfriend claimed that, of the two options left, it would be cheaper for Fraser to borrow the money from the bank.</p> <p>Is she correct? You must explain your answer fully.</p> <p style="text-align: right;">(4)</p>				
<p>2. (a) Multiply out the brackets and simplify $4(2x - 5) + 14$</p> <p style="text-align: right;">(2)</p> <p>(b) Factorise fully $8p - 20$</p> <p style="text-align: right;">(2)</p>				

3. A coin is to be tossed three times.



- (a) Complete the table below to show all eight possible outcomes.
The first one is done for you.
Let **H** – head, **T** – tail.

Throw 1	T							
Throw 2	T							
Throw 3	T							

- (b) Calculate the probability of **only** 2 heads appearing in any order.

4. Below is part of a railway timetable in North Lanarkshire.

Distance from Airdrie (km)		
0	Airdrie	DEPART 0712
4	Coatbridge	DEPART 0718
9.5	Easterhouse	DEPART 0724
12.7	Shettleston	DEPART 0729
21.1	Bellgrove	DEPART 0735
22.2	Glasgow	DEPART 0739

- (a) How long does it take to travel from Easterhouse to Glasgow?

- (b) Calculate the speed of the train from Easterhouse to Glasgow.
Round your answer to the nearest kilometre per hour.

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(3)

(1)

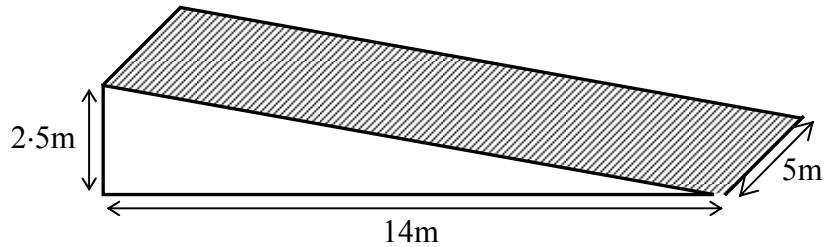
(1)

(4)

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5. The striped 'Sure Grip' surface on a bike ramp has to be replaced. The ramp and its measurements are shown below.



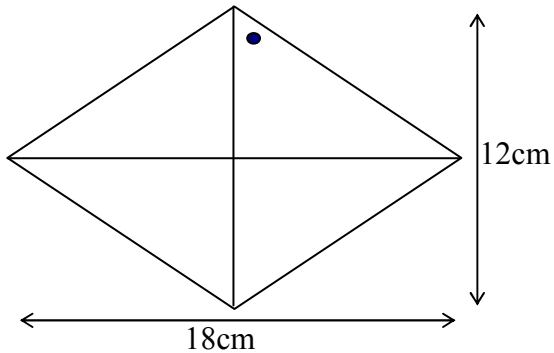
- (a) Calculate the length of the sloping edge of the ramp correct to 1 decimal place.

(3)

- (b) The local council has set a budget of £5 500 to replace this covering. If the covering costs £79.95 per square metre, will they be able to go ahead with the job?
You must give a reason for your answer.

(3)

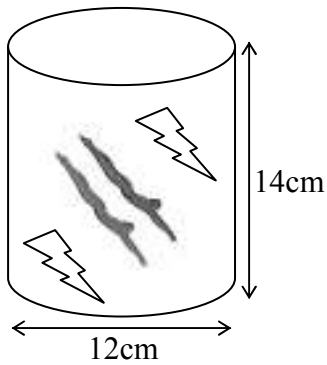
6. A rhombus has diagonals 12cm and 18cm as shown.



Calculate the size of the angle marked ●, to the nearest degree.

(4)

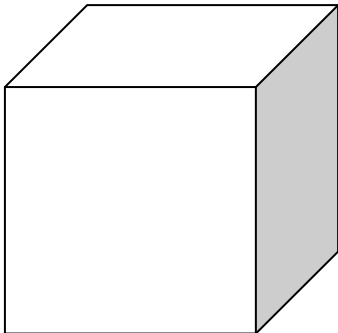
7.



A crystal sports trophy in the shape of a cylinder is placed in a box.

The trophy has diameter 12cm, height 14cm and **fits exactly into the box.**

(a) Calculate the volume of the crystal trophy.

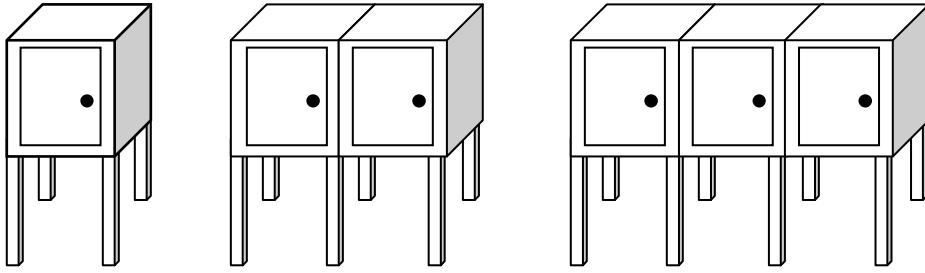


(b) Hence calculate the volume of unused space around the trophy when its in the box.

(2)

(4)

8.



Elevated storage units come in 1, 2, 3, 4, box sizes, as shown above.

(a) Use the diagrams above to help you to complete the following table.

Number of boxes (b)	1	2	3	4		8
Number of legs (l)	4	6				

(b) Write down a formula for the number of legs (l) when you know the number of boxes (b).

(c) If 24 legs are used to build a storage unit, how many boxes are needed?

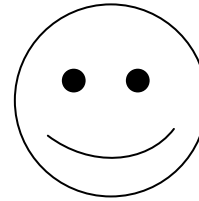
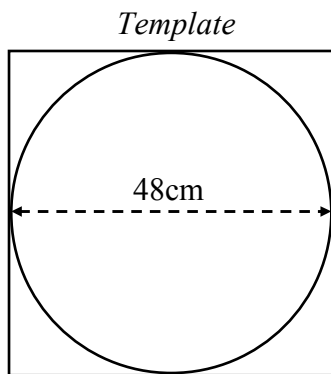
KU RE

(2)

(2)

(2)

9. Primary 5 pupils have each to create a 'Smiley face' from card using the template shown below.



The diameter of the circle is 48cm.

- (a) Calculate the circular area of card needed to make each face, correct to one decimal place.
- (b) Calculate the area of card wasted per face.

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(4)		
(3)		

END OF QUESTION PAPER