SYDNEY BOYS HIGH SCHOOL
MOORE PARK, SURRY HILLS

2008

Year 9
Yearly Examination

Mathematics

General Instructions

- Working time - 90 minutes
- Write using black or blue pen
- Board Approved calculators may be used.
- **All necessary** working should be shown in every question if full marks are to be awarded.
- Marks may not be awarded for messy or badly arranged work.
- Attempt all questions.
- Clearly indicate your class by placing an X next to your class.
- All answers are to be given in simplified exact form unless otherwise stated.

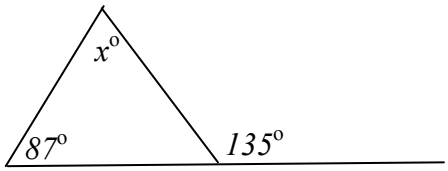
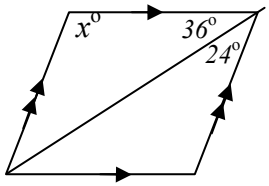
NAME _____

Examiner: *A. Ward*

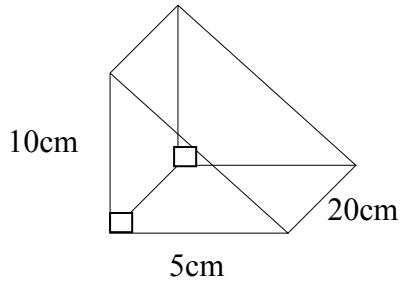
Class	Teacher	Tick
9A	Mr McQuillan	
9B	Ms Roessler	
9C	Ms Nesbitt	
9D	Mr Fuller	
9E	Mr Hespe	
9F	Mr Gainford	
9G	Ms Evans	

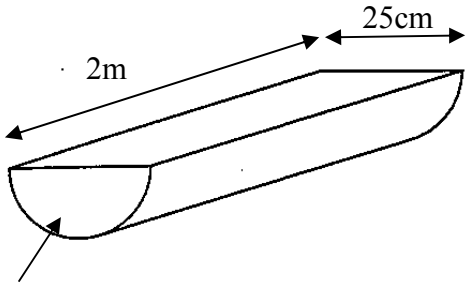
Question	Marks
1	/15
2	/15
3	/15
4	/15
5	/15
6	/15
7	/15
TOTAL	/105

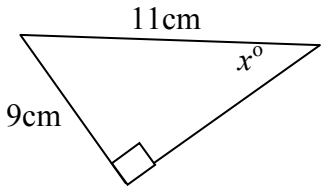
Question One (15 Marks)		**Answers**	**Marks**
a)	Solve $3x+2=7$		1
b)	Calculate $36^2+\frac{72}{6}$		1
c)	Find 112 % of 27.		1
d)	Expand $2(3a+4)$		1
e)	Write 0.85 as a fraction in simplest form.		1
f)	Factorise $2xa-6a$		1
g)	Write as a single fraction in simplest form: $\frac{2t}{7}-\frac{2t}{21}$		1
h)	Calculate m if $\sqrt{525}=m\sqrt{21}$		1
i)	Write in scientific notation. i.) 6.90572 ii.) 0.00960572		 1 1
j)	Simplify: i.) $6x+7-(5x-4)$ ii.) $\frac{7m}{14}\div\frac{m}{2}$ iii.) $10t^2\div 2t^7$		 1 1 1

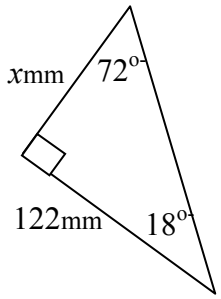
k)	Determine the value of x: i.)  ii.) -		1 1
	 		
	End of Question One		

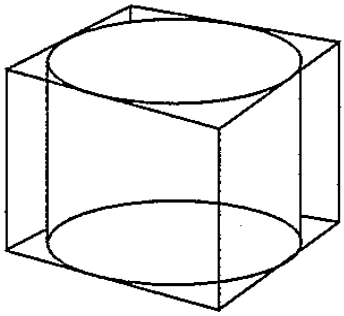
Question Two (15 Marks)		**Answers**	**Marks**
a)	If $x = -4$ and $y = 6$ evaluate: $\frac{xy}{x+y}$		2
b)	Solve $n + 4 = 6n - 3$		1
c)	Evaluate $\left(\frac{7^2}{5^4}\right)^{\frac{1}{2}}$		1
d)	Expand and simplify: $(3x-2)(3x+2)$		2
e)	Simplify the following $\sqrt{75} + \sqrt{108}$		2
f)	Find $\tan 32^\circ$ correct to 3 significant figures.		1

g)	Calculate the volume of the following:  		1
h)	Simplify $4x^o + (4x)^0$		1
i)	Which of the following are irrational numbers: $\pi,\ 0.\dot{1},\ \sqrt{4},\ \sqrt{626},\ 9^{-2}$		1
j)	A cylindrical tank has a base diameter of 20m and height 40m. Find its capacity in litres.		2
k)	Make y the subject of the formula $H = \sqrt{\frac{ay}{5}}$		1
	End of Question Two		

Question Three (15 Marks)		Answers	Marks
a)	Solve: $\frac{3}{x}+\frac{4}{2x}=24$		2
b)	Find the surface area of the following solid, including the top, in m^2. Leave answer in terms of π.  semi-circle		2
c)	If a bag has 3 red, 4 blue and 5 green balls. What is the probability that, if a ball is chosen at random, John would choose: i.) A blue ball ii.) A red or green ball		1 1

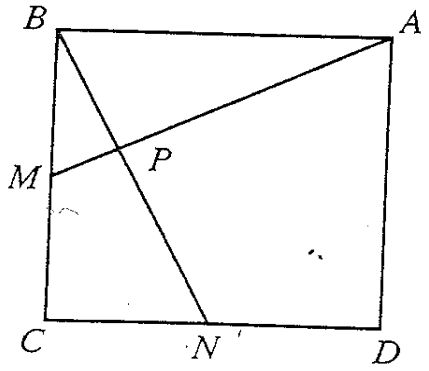
<table>
<tr><td>d)</td><td>Find the value of x to the nearest degree.
 
</td><td></td><td>2</td></tr>
<tr><td>e)</td><td>Find the gradient of the straight line joining the two points (1,7) and (-1,-7).</td><td></td><td>1</td></tr>
<tr><td>f)</td><td>Factorise $x^2 + 4x - 60$.</td><td></td><td>1</td></tr>
<tr><td>g)</td><td>Find the mean, median and mode for the following frequency distribution table.
<table><tr><td>x</td><td>35</td><td>36</td><td>37</td><td>38</td><td>39</td></tr><tr><td>f</td><td>8</td><td>7</td><td>4</td><td>9</td><td>2</td></tr></table></td><td></td><td>3</td></tr>
<tr><td>h)</td><td>Expand and simplify:
$2y(y+2) - 3y(4-3y)$</td><td></td><td>2</td></tr>
<tr><td></td><td colspan="2">End of Question Three</td><td></td></tr>
</table>

Question Four (15 Marks)		Answers	Marks
a)	What is the midpoint of the interval joining the points (51,-12) and (-36,11)		1
b)	Find the internal angle sum of a hexagon.		1
c)	A poker die has faces A, K, Q, J, 10 and 9. It is rolled once. Determine the probability of getting a number face up.		1
d)	Factorise $9x^2 - 121$.		1
e)	Find the value of x correct to 2 decimal places. 		2
f)	Express in general form $3y - 6 = 2x$.		1
g)	Express with a rational denominator; $\frac{1}{4\sqrt{7}}$.		1

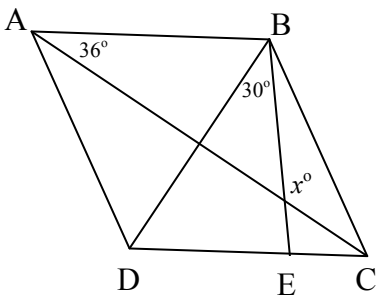
h)	A cylindrical tin of diameter 2cm and height 2cm fits tightly inside a cube with side measurements 2cm. i.) Find the volume of the cylinder ii.) Find the volume of the cube iii.) Express the volume of the cylinder as a percentage of the volume of the cube. 		3
i)	Find the effect on the range when a set of scores has i.) 3 added to each score. ii.) each score halved.		1 1
j)	Make n the subject of: $A = \frac{(n-1)}{n+1}$		2
	End of Question Four		

Question Five (15 Marks)		**Answers**	**Marks**
a)	What is the distance between the points (-2,5) and (3,7).		1
b)	Simplify: $\frac{x^2-2x}{x^2-4}$		2
c)	Solve the inequality: i.) $2(2-x) \geq \frac{1}{3}(9-3x)$ ii.) Graph the solution on a number line.		2 1
d)	Make b the subject of the formula: $x = \frac{-b+\sqrt{b^2-4ac}}{2a}$		2

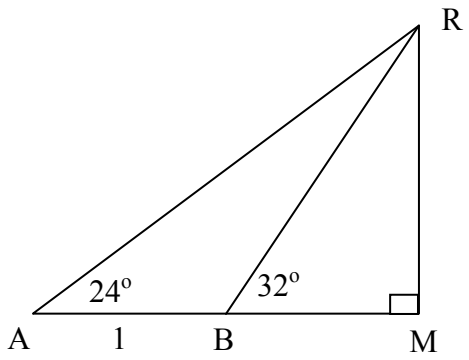
e)	Two dice are thrown. What is the probability of getting a sum of more than 7, when the upper most faces are added together.		2
f)	Find 2 numbers such that if 18 is added to the first number it becomes twice the second number and if 6 is added to the second number it becomes three times the first number.		3
g)	Find a and b if $(x-a)^2 = x^2 - 6x + b$.		2
	End of Question Five		

Question Six (15 Marks)		Answers	Marks
a)	Determine, without a calculator, which is greater 4^{100} or 6^{75} (show full working).		2
b)	Find the y intercept of the straight line: $\frac{x}{4}+\frac{y}{8}=10$		1
c)	ABCD is a square; M and N are the midpoints of BC and CD respectively.  i.) Prove that triangles ABM and BCN are congruent. ii.) Prove that AM and BN are perpendicular.		2 3

d)	Factorise $12x^2 - 5x - 2$		2
e)	Determine a if $2x + 5y = 11$ and $ax - 3y = 9$ are perpendicular.		2
f)	Express with a rational denominator: $\dfrac{\sqrt{5}}{2\sqrt{3} + \sqrt{2}}$		3
	End of Question Six		

Question 7 (15 Marks)		Answers	Marks
a)	Simplify: $\frac{7}{x^2-7x+10}-\frac{2}{x^2-5x}$		3
b)	Given the points $X(-1,3)$ and $Y(-4,1)$, find the equation of the perpendicular bisector of XY.		3
c)	ABCD is a rhombus. $\angle DBE = 30^o$ and $\angle BAC = 36^o$. Determine the value of x. (Reasons not required). 		2

d)

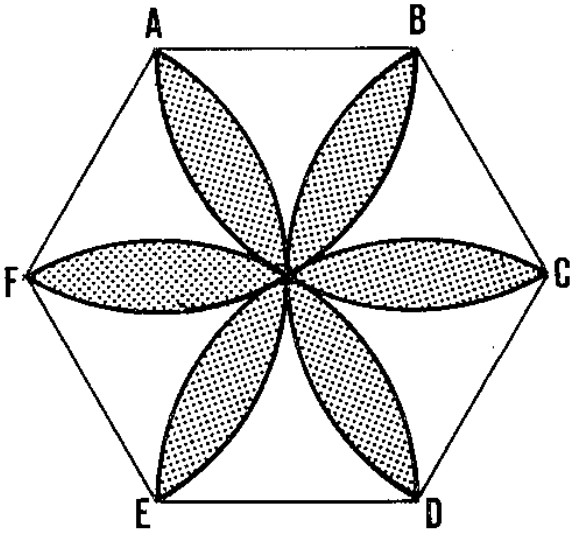


In the above diagram AB is 1 unit and the angles are as marked.

i.) Prove that $RM = \dfrac{\tan 24^o \tan 32^o}{\tan 32^o - \tan 24^o}$ — 3

ii.) Find RM correct to 2 decimal places. — 1

e) The regular hexagon ABCDEF has sides 1cm. Find the shaded area (answer in terms of π) — 3



End of Question Seven

End Of Examination		
Additional Space for Answers		**Marks**
Question Number	Put "**see back**" at original question.	

