Name: ..... Maths Class: .....

SYDNEY TECHNICAL HIGH SCHOOL

YEAR 10 YEARLY EXAMINATION

Mathematics

PART B

SECTION 1
(NON CALCULATOR)

OCTOBER 2009

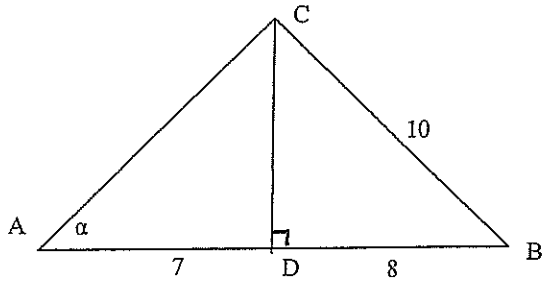
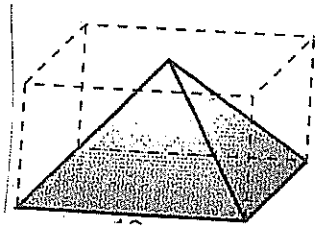
TIME ALLOWED: 25 minutes for this section only

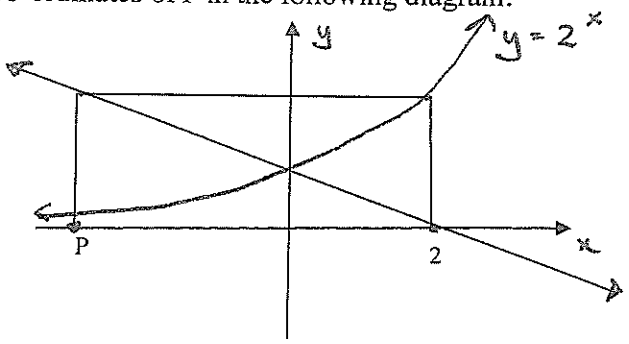
Instructions:

- Write your name and class at the top of this page,
- This section is to be handed in after 25 minutes.
- Calculators may NOT be used for this section.
- ALL questions are worth 1 mark. TOTAL MARKS FOR THIS SECTION= 15
- Place all answers in the column at the right of each question headed "ANSWER ONLY"

/15

	SECTION 1: NON CALCULATOR SECTION	ANSWERS ONLY
1	Fully factorise $ax^2 - 3x - ax + 3$	
2	Solve for x: $2x(3x - 4) = 0$	
3	Solve the following simultaneous equations to find x $\begin{cases} 3x + 5y + 1 = 0 \\ x - y = 1 \end{cases}$	$x=$
4	Evaluate $64^{\frac{3}{2}}$	
5	Give the x-values of the points of intersection of the curves $y = x^2 - x - 2$ and $x + y = 2$	$x=$
6	Solve $x^2 = 4x$	
7	A hat contains 3 black discs and 2 red ones, all identical except for colour. A disc is drawn and it is noted that it is red. It is not put back. What is the probability in another random draw that the next disc will also be red?	
8	James bought a car on E-Bay and later onsold it for a profit of 10% on what he paid. If he sold the car for $15 400, how much did he buy it for?	

9	In the diagram below, find an expression for tan α:  	
10	Simplify $2^{n+1} - 2^n$	
11	In a footy tipping competition there are 500 tipsters trying to pick the winners each week of 8 games. Over the 20 weeks of the competition, the mean score per week was 6.5 winners, while the mode score each week was 5 winners. If a person was picked at random from the 500 tipsters, how many winners could you reasonably expect he or she to have tipped?	
12	This right rectangular pyramid is built inside a rectangular prism as shown, with the vertex of the pyramid just touching the top of the rectangular prism.  What is the ratio of the volume of the rectangular prism to the pyramid?	
13	Evaluate: $2 + \frac{1}{2+\frac{1}{2}}$	

14	Give the co-ordinates of P in the following diagram:  	
15	In a right triangle ABC, $tanA = \frac{x}{y}$. Find an expression for cosA.	

END OF PART B SECTION 1

Name: ..... SOLUTIONS ..... Maths Class: .....

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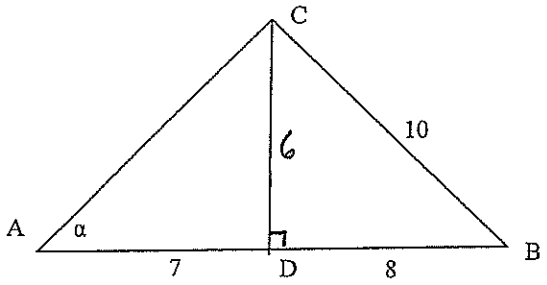
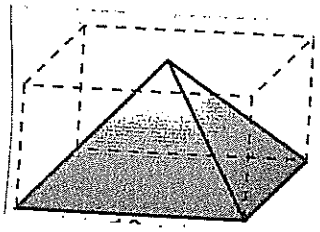
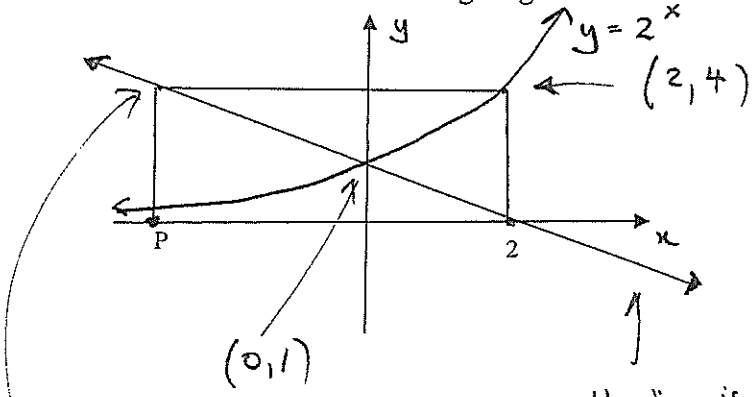
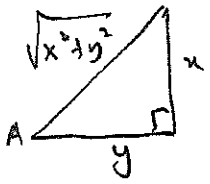
	SECTION 1: NON CALCULATOR SECTION	ANSWERS ONLY
1	Fully factorise $ax^2 - 3x - ax + 3$ $x(ax-3)-1(ax-3)$ $(ax-3)(x-1)$	$(ax-3)(x-1)$
2	Solve for x: $2x(3x - 4) = 0$	$x=0$ or $x=4/3$
3	Solve the following simultaneous equations to find x $[\ 3x + 5y + 1 = 0$ $[\ x - y = 1 \quad (2)$ $(1)\times 5 \quad 5x-5y=5 \quad (3)$ $(1)+(3) \quad 8x+1=5$ $x = 1/2$	$x = 1/2$
4	Evaluate $64^{\frac{3}{2}}$	512
5	Give the x-values of the points of intersection of the curves $y = x^2 - x - 2$ and $x + y = 2$ $2-x = x^2-x-2$ $x^2 = 4$	$x = \pm 2$
6	Solve $x^2 = 4x$ $x(x-4)=0$	$x=0$ $x=4$
7	A hat contains 3 black discs and 2 red ones, all identical except for colour. A disc is drawn and it is noted that it is red. It is not put back. What is the probability in another random draw that the next disc will also be red?	$1/4$
8	James bought a car on E-Bay and later onsold it for a profit of 10% on what he paid. If he sold the car for \$15 400, how much did he buy it for?	\$14,000

9	In the diagram below, find an expression for tan α:  	6/7
10	Simplify $2^{n+1} - 2^n$ $2^n(2-1)$	2^n
11	In a footy tipping competition there are 500 tipsters trying to pick the winners each week of 8 games. Over the 20 weeks of the competition, the mean score per week was 6.5 winners, while the mode score each week was 5 winners. If a person was picked at random from the 500 tipsters, how many winners could you reasonably expect he or she to have tipped?	5
12	This right rectangular pyramid is built inside a rectangular prism as shown, with the vertex of the pyramid just touching the top of the rectangular prism.  What is the ratio of the volume of the rectangular prism to the pyramid?	1/3
13	Evaluate: $2 + \frac{1}{2+\frac{1}{2}}$ $2 + 1/5/2$ $= 2\,2/5$	$2\,2/5$

14	Give the co-ordinates of P in the following diagram:  this is $y = 4$ $x = -6$ this line is $y - 0 = -\frac{1}{2}(x-2)$ $2y = -x + 2$ $2y + x - 2 = 0$	$(-6, 0)$ accept or $x = -6$ or -6
15	In a right triangle ABC, $tanA = \frac{x}{y}$. Find an expression for cosA.  	$\frac{y}{\sqrt{x^2+y^2}}$

END OF PART B SECTION 1