



**SYDNEY BOYS HIGH
SCHOOL**
MOORE PARK, SURRY HILLS

2007

Year 7
Yearly Examination

TOTAL

/120

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.
- If more space is required, clearly write the number of the QUESTION on one of the back pages and answer it there. Indicate next to the actual question that you have done so.
- Attempt all questions.
- Clearly indicate your class by placing an X next to your class.

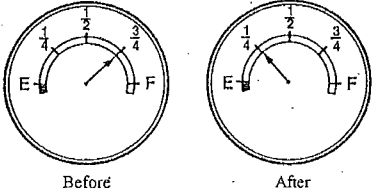
NAME _____

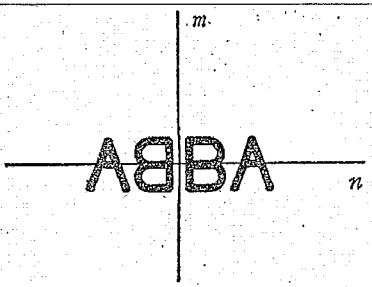
Examiner: *R. Boros*

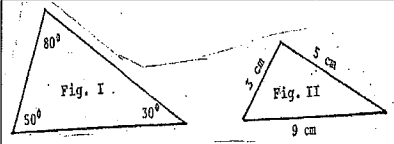
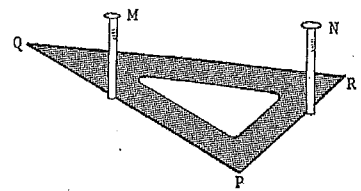




Class	Teacher	Tick
7E	Mr Gainford	
7F	Mr McQuillan	
7M	Ms Roessler	
7R	Ms Nesbitt	
7S	Mr Hespe	
7T	Mr McQuillan	

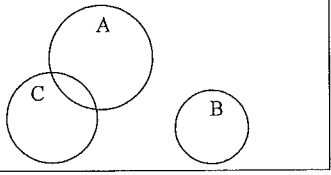
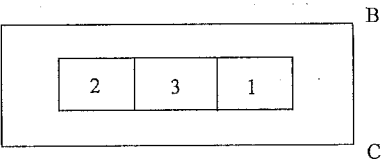
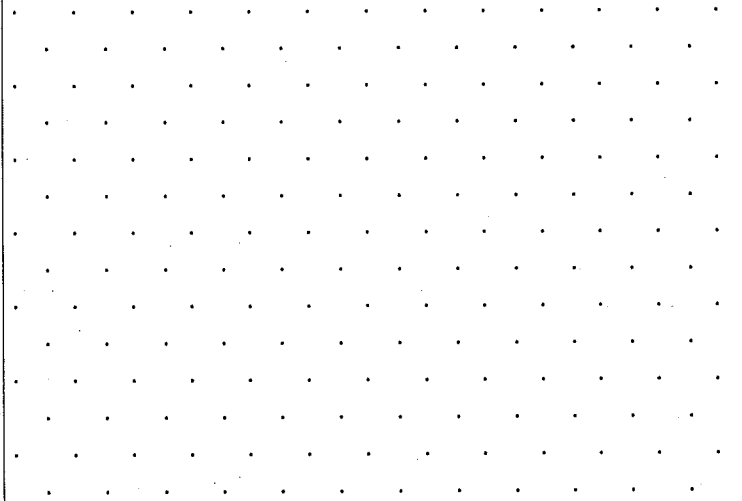
Question	Marks
1	/20
2	/20
3	/20
4	/20
5	/20
6	/20

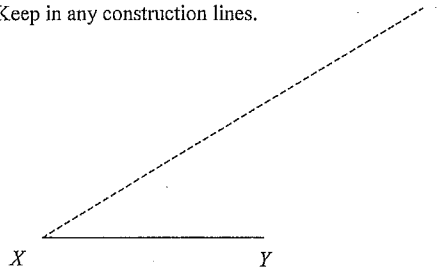
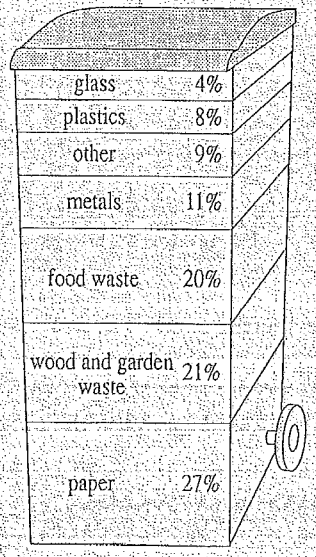
Question One (20 Marks)	Answers	Marks
(a) What is $12\frac{1}{2}\%$ of \$166?		1
(b) Write $2xyxy2ppp$ in index form.		1
(c) Convert 823mm to metres.		1
(d) List all the subsets of $\{\Delta, \square\}$.		2
(e) List all the prime numbers between 17 and 30.		1
(f) What is 0.584 as a fraction in simplest form?		1
(g) Write 2455 in Roman Numerals.		1
(h) Simplify $2xy - 5yx + 7$		1
(i) Expand $5m(1-m)$		1
(j) Simplify $3p^2 \times 2p^3$		1
(k) Simplify $12p^4 + 2p^4$		1
(l) Insert grouping symbols to make a true statement with the following: $4 \times 9 \div 2 + 8 \div 4 = 20$		1
(m) Solve for x: $2 + x = -7$		1
(n) The point R(2,4) is on the number plane. What is the point 5 units to the right and 4 units below R?	(\quad , \quad)	1

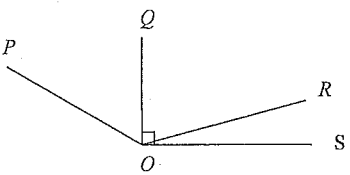
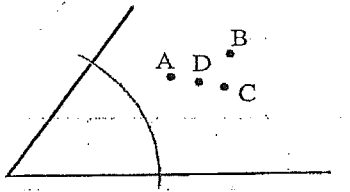
(o) Use the given prime factors to find the HCF (Highest Common Factor) of this pair of numbers: $630 = 2 \times 3 \times 3 \times 5 \times 7$ $2940 = 2 \times 2 \times 3 \times 5 \times 7 \times 7$		1
(p) Use the given prime factors to find the LCM (Lowest Common Multiple) of this pair of numbers: $630 = 2 \times 3 \times 3 \times 5 \times 7$ $2940 = 2 \times 2 \times 3 \times 5 \times 7 \times 7$		1
(q) Write down the largest 5 digit odd number with a four in the hundreds place and a 3 in the units place.		1
(r) Is it possible to have a polyhedron with 15 faces, 16 edges and 5 vertices? Give reasons for your answer.		1
(s) The diagrams below show the petrol gauge of a car before and after a trip.  The car's petrol tank holds 56 litres when full. How many litres were used on the trip?		1

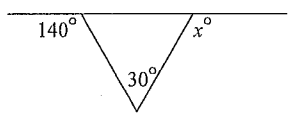
Question Two (20 Marks)		Answers	Marks
(a)	Insert a < or > sign in order to make a true statement: $\frac{7}{11} \square \frac{16}{25}$		1
(b)	Write this recurring decimal using the appropriate dot notation: $72.712712712\dots$		1
(c)	Write as a single numeral $5 \times 10^4 + 3 \times 10^3 + 5 \times 10 + 9$		1
(d)	Simplify $ -5 - 8 $		1
(e)	What is 68 in base 2 (binary)?		1
(f)	Given that $A = \{p, r, t, w\}$ and $B = \{p, a, t, u\}$, write down $A \cup B$.		1
(g)	The fraction half way between X and $3\frac{2}{5}$ is $1\frac{7}{12}$. Find the value of X as a mixed numeral.		1
(h)	Write an algebraic expression for "four less than the product of six and p ".		1
(i)	 <p>Which line is an axis of symmetry?</p> <p>A. m only. B. n only. C. Both m and n. D. Neither m nor n.</p>		1

(j)	 <p>Which of the above figures could actually be drawn using the measurements shown?</p> <p>A. I only. B. II only. C. Both I and II D. Neither I nor II</p>		1
(k)	<p>Two nails M and N are hammered into a board as shown. A set square PQR is placed on the board so that the two shorter sides touch the nails.</p>  <p>If the set square was moved so that PQ always touches nail M and PR always touches N, the path of P would be: (circle the correct answer)</p> <p>A.  B.  C.  D. </p>		1
(l)	Use your calculator to evaluate correct to 2 decimal places: $\frac{1.28^2 + 3.56}{4 - \sqrt{1.38}}$		1

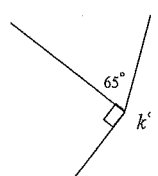
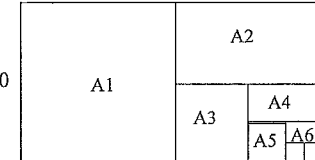
(m)	Angie scored $\frac{14}{18}$ and $\frac{16}{21}$ in two spelling tests. To the nearest whole number calculate her best score as a percentage.	1
(n)	Shade in $(A \cap C) \cup B$ 	1
(o)	The numbers in the diagram below represent the height of the stacks of blocks used.  Using the isometric dots given below draw a sketch of this solid looking from point C	2
		
(p)	A bag has equal sized and weighted balls in it. There are 3 blue balls, 5 red balls and 2 white balls. Find the probability of picking one ball that is white or blue.	1

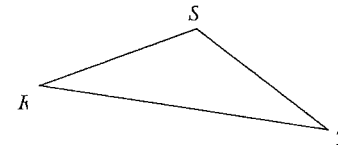
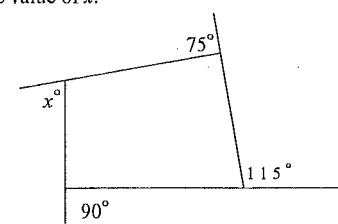
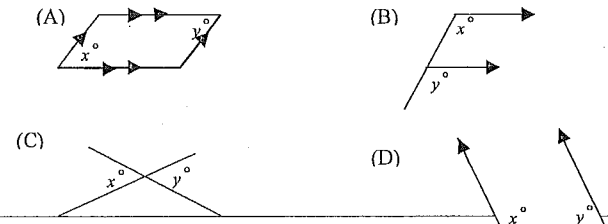
(q)	Sofia is drawing an isosceles triangle XYZ . XY is one side of the triangle. Point Z is to be on the dotted line through X . Complete the triangle so that $XY = YZ$. Keep in any construction lines.	1
		
(r)	WASTE: WHAT WE THROW OUT (BY WEIGHT) 	
(i)	Which two items together make up $\frac{3}{20}$ of the waste?	1
(ii)	If 15kg of food waste is thrown out, what weight of plastics is thrown out?	1

(k)	<p>Which angle is obtuse? (circle the letter of the correct answer)</p> 	<p>(A) $\angle POQ$ (B) $\angle QOR$ (C) $\angle QOS$ (D) $\angle POR$</p>	1
(l)	<p>David started to bisect this angle. Complete the construction to find which point (A, B, C or D) lies on the bisector, write the letter of this point.</p> 		1
(m)	<p>Given $s = ut + \frac{1}{2}at^2$ and $s = 200$, a correct set of values for u, a and t is: (circle the letters of the correct answers):</p>	<p>(A) $u = 20, a = 8, t = -5$ (B) $u = 20, a = 8, t = 5$ (C) $u = -20, a = 8, t = -5$ (D) $u = -20, a = 8, t = 5$</p>	2
(n)	<p>Doug is $\frac{1}{3}$ the age of his father who is $12x$ years old. In 5 years time, what will the sum of their ages be?</p>		1

(o)	<p>Find the value of x.</p> 		1
(p)	<p>A gardener is told “never cut more than $\frac{1}{3}$ off the grass height in a single mowing”</p> <p>The lawn is $4\frac{1}{2}$ cm high. What is the minimum height to which the gardener should cut the lawn? (circle the letter of the correct answer):</p> <p>(A) $1\frac{1}{2}$ cm (B) 3 cm (C) $4\frac{1}{6}$ cm (D) 6 cm</p>		1

Go to next page:

Question Five (20 Marks)		Answers	Marks
(a)	What is the reciprocal of $5\frac{2}{3}$. Answer as a fraction.		2
(b)	Given that $x = -3$, evaluate $-2(x)^3$		1
(c)	What is the first square number that is just less than 260?		1
(d)	Add together the fifth and the ninth Fibonacci number.		2
(e)	Find the value of k .	$k =$	2
			
(f)	The largest standard paper size is A0. Two A1 sheets can be cut from one A0. Two A2 sheets can be cut from one A1 and so on. How many A4 sheets can be cut from one A0 sheet.		1
			

(g)	Name and measure the largest angle in this triangle (to the nearest degree).		2
			
(h)	The sides of a quadrilateral are extended to make the angle whose sizes are shown. Find the value of x .	$x =$	1
			
(i)	A town has 2500 residents of whom 60% voted in an election to fill a council vacancy. The result was that , of those who voted, 38% voted for P, 32% voted for Q and 30% voted for R. Under the voting system, P was elected. Find the number of residents who voted for P.		2
(j)	Mark works 7 nights per week as a poker machine repair man. He works from 9pm until 3am. He earns \$27 per hour before midnight and \$32.50 per hour after midnight. How much did he earn in a week?		2
(k)	In which figure is x not necessarily equal to y . (circle the letter of the correct answer)		1
			

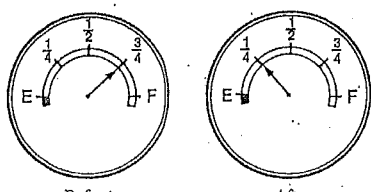
(1)	<p>The value of $50!$ is the product of all the whole numbers from 1 to 50 inclusive, i.e.</p> $50! = 50 \times 49 \times 48 \times \dots \times 4 \times 3 \times 2 \times 1$ <p>Find the maximum number of times that 2 will divide into $50!$ exactly.</p>	3

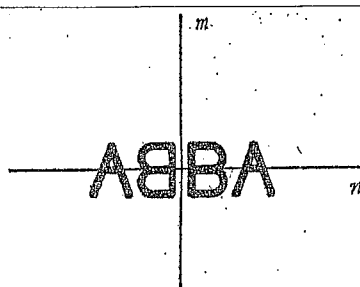
Question Six (20 Marks)		Answers	Marks
(a)	<p>The number 21 can be expressed as a <u>sum of two or more consecutive positive integers</u> in three different ways, namely</p> $21 = 10 + 11$ $21 = 6 + 7 + 8$ $21 = 1 + 2 + 3 + 4 + 5 + 6$ <p>Find the number of ways 63 can be expressed as such a sum.</p>		3
(b)	<p>Some new maths symbols tell us that $P\uparrow$ means $(P+1)$ and $P\downarrow$ means $(P-1)$. Then $(4\uparrow) \times (3\downarrow)$ is equal to: (circle the correct answer)</p> <p>(A) $9\downarrow$ (B) $10\uparrow$ (C) $11\downarrow$ (D) $12\uparrow$ (E) $13\downarrow$</p>		3
(c)	<p>If there are 10 people at a party and each person shakes hands with every other person just once, find the number of handshakes.</p>		3
(d)	<p>A school bus leaves the depot with the driver and one pupil aboard. It picks up pupils at three stops and no pupil gets off the bus until it arrives at school. At each stop, after the first, it picks up twice as many pupils as it did at the previous stop. The number of pupils the bus has on board when it arrives at school could be: (circle the correct answer)</p> <p>(A) 27 (B) 32 (C) 35 (D) 43 (E) 48</p>		3
(e)	<p>Graph $x > -4$ on a number line.</p>		2

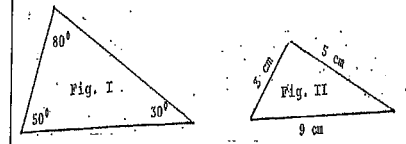

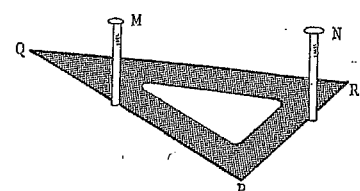
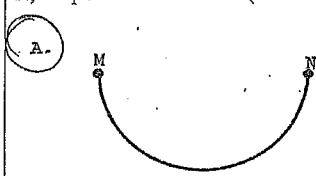
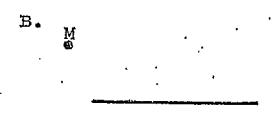
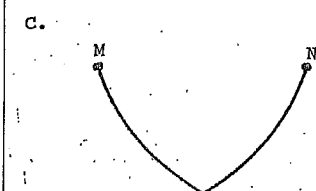
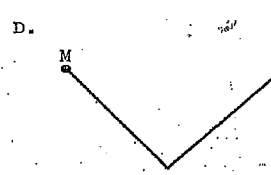
(f)	A ball is dropped to the ground from a height of 100cm and rebounds to a height of 50cm. It continues to rebound each time to half of its preceding height. What is the total distance travelled by the ball when it hits the ground for the third time.		3
(g)	It can be proved (by checking) that $1^3 + 2^3 = 3^2$ and $1^3 + 2^3 + 3^3 = 6^2$ (i) If we were able to generalise from these two statements, what would we expect $1^3 + 2^3 + 3^3 + 4^3$ to equal? (ii) Again, if we were able to generalise, how many such numbers, each cubed, would add together to give a total of 441?		1 2
END OF EXAMINATION For additional space for answers see next page.			

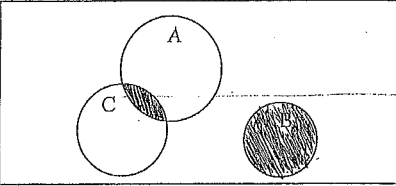
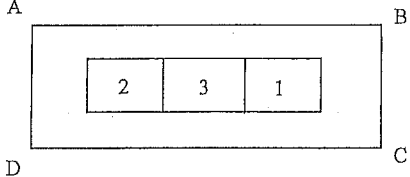
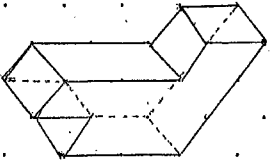
Additional Space for Answers		Marks
Question Number	Put "see back" at original question.	

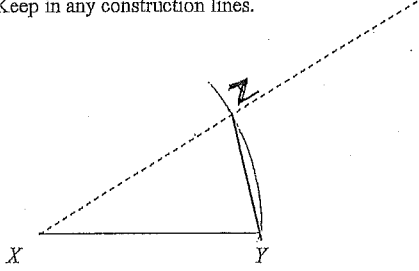
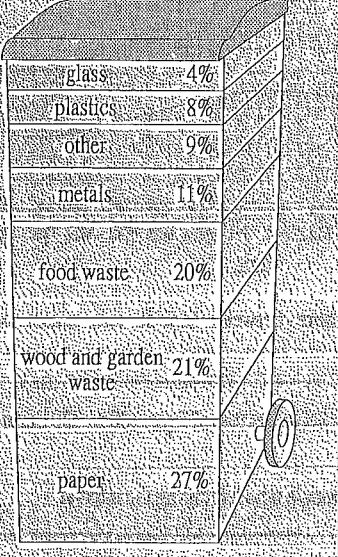
Question One (20 Marks)		Answers	Marks
(a)	What is 12 ½ % of \$166?	\$20.75	1
(b)	Write $2xy^2ppp$ in index form.	$4p^3x^2y^2$	1
(c)	Convert 8231mm to metres.	8.231m.	1
(d)	List all the subsets of $\{\Delta, \square\}$.	$\{\Delta, \square\}, \{\Delta\}, \{\square\}, \phi$	2
(e)	List all the prime numbers between 17 and 30.	19, 23, 29.	1
(f)	What is 0.584 as a fraction in simplest form?	$\frac{73}{125}$	1
(g)	Write 2455 in Roman Numerals.	MMCDLV	1
(h)	Simplify $2xy - 5yx + 7$	$7 - 3xy$	1
(i)	Expand $5m(1-m)$	$5m - 5m^2$	1
(j)	Simplify $3p^2 \times 2p^3$	$6p^5$	1
(k)	Simplify $12p^4 + 2p^4$	6	1
(l)	Insert grouping symbols to make a true statement with the following: $4 \times 9 + 2 + (8 + 4) = 20$		1
(m)	Solve for x: $2 + x = -7$	$x = -9$	1
(n)	The point R(2,4) is on the number plane. What is the point 5 units to the right and 4 units below R?	(7,0)	1

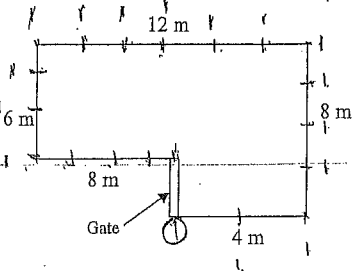
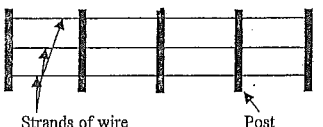
(o)	Use the given prime factors to find the HCF (Highest Common Factor) of this pair of numbers: $630 = 2 \times 3 \times 3 \times 5 \times 7$ $2940 = 2 \times 2 \times 3 \times 5 \times 7 \times 7$	$2 \times 3 \times 5 \times 7 = 210.$	1
(p)	Use the given prime factors to find the LCM (Lowest Common Multiple) of this pair of numbers: $630 = 2 \times 3 \times 3 \times 5 \times 7$ $2940 = 2 \times 2 \times 3 \times 5 \times 7 \times 7$	$2^2 \times 3^2 \times 5 \times 7 \times 7 = 8820$	1
(q)	Write down the largest 5 digit odd number with a four in the hundreds place and a 3 in the units place.	99493	1
(r)	Is it possible to have a polyhedron with 15 faces, 16 edges and 5 vertices? Give reasons for your answer.	$15 + 5 = 20$ $16 + 2 = 18$ No. Euler's Formula $f + v = e + 2$.	1
(s)	The diagrams below show the petrol gauge of a car before and after a trip.  Before After The car's petrol tank holds 56 litres when full. How many litres were used on the trip?	28 litres.	1

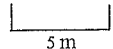
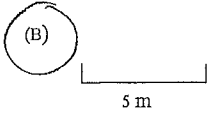
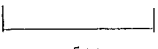

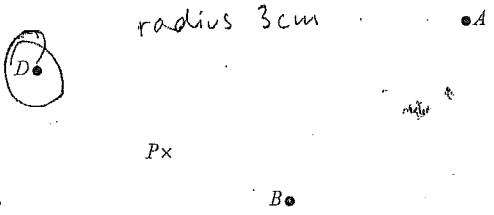
Question Two (20 Marks)		Answers	Marks
(a)	Insert a < or > sign in order to make a true statement: $\frac{7}{11} \square \frac{16}{25}$	$\frac{7}{11} \approx 0.636364$ $\frac{16}{25} = 0.64$	1
(b)	Write this recurring decimal using the appropriate dot notation: 72.712712712....	72. $\dot{7}1\dot{2}$	1
(c)	Write as a single numeral $5 \times 10^4 + 3 \times 10^3 + 5 \times 10 + 9$	53059	1
(d)	Simplify $ -5 - 8 $	-3	1
(e)	What is 68 in base 2 (binary)?	1000100 _{two}	1
(f)	Given that $A = \{p, r, t, w\}$ and $B = \{p, a, t, u\}$, write down $A \cup B$.	$\{p, r, t, w, a, u\}$	1
(g)	The fraction half way between X and $3\frac{2}{5}$ is $1\frac{7}{12}$. Find the value of X as a mixed numeral.	$3\frac{2}{5} - 1\frac{7}{12} = 1\frac{49}{60}$ $1\frac{7}{12} - 1\frac{49}{60} = -\frac{7}{30}$	1
(h)	Write an algebraic expression for "four less than the product of six and p ".	$6p - 4$	1
(i)	 <p>Which line is an axis of symmetry?</p> <p>A. m only. B. n only. C. Both m and n. D. Neither m nor n.</p>	A	1

(j)	 <p>Which of the above figures could actually be drawn using the measurements shown?</p> <p>A. I only. B. II only. C. Both I and II D. Neither I nor II</p>		1
(k)	<p>Two nails M and N are hammered into a board as shown. A set square PQR is placed on the board so that the two shorter sides touch the nails.</p>  <p>If the set square was moved so that PQ always touches nail M and PR always touches nail N, the path of P would be: (circle the correct answer)</p> <p>A.  B.  C.  D. </p>	1	
(l)	Use your calculator to evaluate correct to 2 decimal places: $\frac{1.28^2 + 3.56}{4 - \sqrt{1.38}}$	1.84	1

(m)	Angie scored $\frac{14}{18}$ and $\frac{16}{21}$ in two spelling tests. To the nearest whole number calculate her best score as a percentage.	78%	1
(n)	Shade in $(A \cap C) \cup B$		1
(o)	The numbers in the diagram below represent the height of the stacks of blocks used.		2
	Using the isometric dots given below draw a sketch of this solid looking from point C		
(p)	A bag has equal sized and weighted balls in it. There are 3 blue balls, 5 red balls and 2 white balls. Find the probability of picking one ball that is white or blue.	$\frac{1}{2}$	1

(q)	Sofia is drawing an isosceles triangle XYZ . XY is one side of the triangle. Point Z is to be on the dotted line through X . Complete the triangle so that $XY = YZ$. Keep in any construction lines.		1
(r)	WASTE WHAT WE THROW OUT (BY WEIGHT)		
(i)	Which two items together make up $\frac{3}{20}$ of the waste?	glass and metals.	1
(ii)	If 15kg of food waste is thrown out, what weight of plastics is thrown out?	15kg 6kg.	1

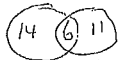
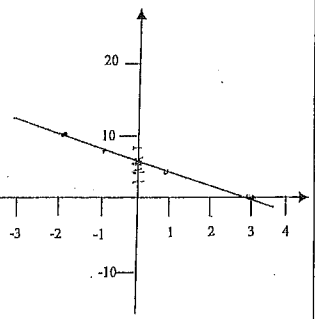





Question Three (20 Marks)	Answers	Marks
<p>(a) A yard is to be fenced, and a gate included, as shown on the diagram.</p>  <p>(i) Find the length of the gate.</p> <p>The fence will need vertical posts and three strands of wire, as shown.</p>  <p>(ii) How many metres of wire are needed to fence the block of land? (ignore extra wire needed for tying to posts).</p> <p>(iii) A post is to be placed at each side of the gate, and then every two metres. How many posts are needed?</p>	<p>2 m</p> <p>$(8+6+12+8+4) \times 3$ 114 m</p> <p>20 posts</p>	<p>1</p> <p>1</p> <p>1</p>
<p>(b) The equation $w^2 = 16w$ has $w = 16$ as one solution. What is the other solution?</p>	<p>$w = 0$</p>	<p>1</p>
<p>(c) Convert 11011011_2 to a decimal numeral.</p>	<p>$1+2+0+2^3+2^4+0+2^6+2^7$ 219</p>	<p>2</p>

(d)	Paul left Brighton at 7.10am and drove for 4.2 hours before stopping for an early lunch and walk about in a town (which took 1.85 hours). At what time did Paul resume driving?	<p>7.10am + 4hrs 12min + 1hr 51min 1.13pm or 13.13</p>	1										
(e)	One of the lines below has been drawn to a scale of 1 centimetre to 2 metres. Which line is it? (circle the letter of the correct answer)	<p>1:200</p> <p>(A)  5 m</p> <p>(B)  5 m</p> <p>(C)  5 m</p> <p>(D)  5 m</p>	1										
(f)	Charles wants to draw a circle with centre P and diameter 6cm. Which of the points A, B, C or D lie on the circumference of the circle (circle the letter of the correct answer)?	<p>radius 3cm</p> 	1										
(g)	Simplify $4x^3 - 3x^3 + x^2$	$x^3 + x^2$	1										
(h)	Simplify $(4x^3y)^2$	$16x^6y^2$	1										
(i)	Simplify $7q + 2p - 10q - 5p$	$-3q - 3p$	1										
(j)	Which formula has the algebra machine used in this table (circle the letter of the correct answer)	<table border="1" data-bbox="1344 1236 1814 1324"> <tbody> <tr> <td>m</td> <td>2</td> <td>7</td> <td>-1</td> <td>-2</td> </tr> <tr> <td>m</td> <td>12</td> <td>22</td> <td>6</td> <td>4</td> </tr> </tbody> </table> <p>(A) $m = 3n + 6$ (B) $m = n + 10$</p> <p>(C) $m = 30 + 9n$ (D) $m = 2n + 8$</p>	m	2	7	-1	-2	m	12	22	6	4	1
m	2	7	-1	-2									
m	12	22	6	4									

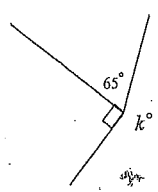
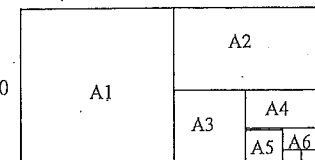
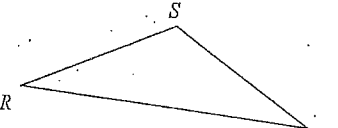
(k)	Which angle is obtuse? (circle the letter of the correct answer)	<p>(A) $\angle POQ$</p> <p>(B) $\angle QOR$</p> <p>(C) $\angle QOS$</p> <p>(D) $\angle POR$</p>	1
(l)	David started to bisect this angle. Complete the construction to find which point (A, B, C or D) lies on the bisector, write the letter of this point.		1
(m)	Given $s = ut + \frac{1}{2}at^2$ and $s = 200$, a correct set of values for u , a and t is: (circle the letter of the correct answer):	<p>(A) $u = 20, a = 8, t = -5$</p> <p>(B) $u = 20, a = 8, t = 5$</p> <p>(C) $u = -20, a = 8, t = -5$</p> <p>(D) $u = -20, a = 8, t = 5$</p>	2
(n)	Doug is $\frac{1}{3}$ the age of his father who is 12x years old. In 5 years time, what will the sum of their ages be?	<p>Doug $4x$</p> <p>father $12x$</p> <p>$4x + 5 + 12x + 5$</p> <p>$= 16x + 10$</p>	1

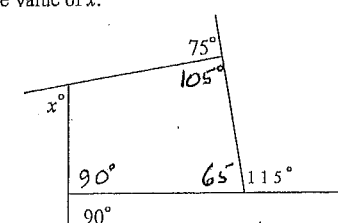
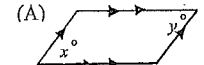
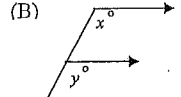
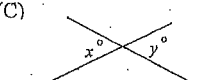
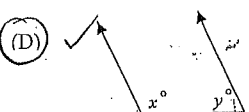
(o)	Find the value of x .		1
<p>(p) A gardener is told "never cut more than $\frac{1}{3}$ off the grass height in a single mowing"</p> <p>The lawn is $4\frac{1}{2}$ cm high. What is the minimum height to which the gardener should cut the lawn? (circle the letter of the correct answer):</p> <p>(A) $1\frac{1}{2}$ cm</p> <p>(B) 3 cm</p> <p>(C) $4\frac{1}{6}$ cm</p> <p>(D) 6 cm</p>		<p>70°</p>	1

Go to next page:

Question Four (20 Marks)		Answers	Marks												
(a)	Expand and simplify $-(1-5w)+2(1-5w)$	$-1+5w+2-10w = -1-5w$	2												
(b)	Given $n(A)=20$, $n(B)=17$ and $n(A \cap B)=6$, find $n(A \cup B)$	$20+17-6 = 31$  $14+6+11 = 31$	2												
(c)	Eric wants to graph the straight line $y=-2x+6$. (i) Complete the table of values below for $y=-2x+6$ <table border="1" data-bbox="190 518 582 598"> <tr> <td>x</td> <td>-2</td> <td>-1</td> <td>0</td> <td>1</td> </tr> <tr> <td>y</td> <td>10</td> <td>8</td> <td>6</td> <td>4</td> </tr> </table> (ii) Hence graph $y=-2x+6$ on the number plane provided by plotting (x, y)	x	-2	-1	0	1	y	10	8	6	4		2 2		
x	-2	-1	0	1											
y	10	8	6	4											
(d)	 One unit of length is represented by the diagram above. Which diagram on the right represents 0.2 units of length. (Circle the letter of the correct answer) (A)  (B)  (C)  (D) 		1												
(e)	Look carefully at the pattern of numbers in this table. Then complete the formula on the right by filling in the blanks. <table border="1" data-bbox="190 1276 582 1356"> <tr> <td>c</td> <td>0</td> <td>14</td> <td>11</td> <td>6</td> <td>$12\frac{1}{2}$</td> </tr> <tr> <td>d</td> <td>32</td> <td>4</td> <td>10</td> <td>20</td> <td>7</td> </tr> </table>	c	0	14	11	6	$12\frac{1}{2}$	d	32	4	10	20	7	$c = 16 - d/2$	2
c	0	14	11	6	$12\frac{1}{2}$										
d	32	4	10	20	7										
(f)	Find a pair of numbers 'a' and 'b' such that $2^a \times 2^b = 2^{-3}$	$a = -1$ $b = -2$ } e.g. $a+b = -3$	2												

(g)	Numbers may be chained together in many ways. The rule 'twice the units digit, then add the tens digit' makes a chain from 54 as follows: $54 \rightarrow 13 \rightarrow 7 \rightarrow 14 \rightarrow \dots \rightarrow \dots$ (i) Write down the next two numbers in the chain. (ii) If the first number is Δ , the chain is: $\Delta \rightarrow 12 \rightarrow 5$. Find two possible values of Δ .	$9 \ 18$ $6 \ 25 \ 44 \ 63 \ 82$	2 2
(h)	Draw a picture of a rhombus, showing its important properties.		1
	(i) List TWO properties that a rhombus has that a parallelogram does not have.	<u>Diagonals meet at right angles, all sides equal</u>	1
	(ii) Write down ONE additional property that a square has, that a rhombus does not have.	<u>all right angles, diagonals equal</u>	1

Question Five (20 Marks)		Answers	Marks
(a)	What is the reciprocal of $5\frac{2}{3}$. Answer as a fraction. $5\frac{2}{3} = \frac{17}{3}$ ✓	$\frac{3}{17}$ ✓	2
(b)	Given that $x = -3$, evaluate $-2(x)^3$	$-2 \times (-27) = 54$ ✓	1
(c)	What is the first square number that is just less than 260? $\sqrt{260} \approx 16.1$	$16^2 = 256$ ✓	1
(d)	Add together the fifth and the ninth Fibonacci number. 1, 1, 2, 3, 5, 8, 13, 21, 34	$34 + 5 = 39$ ✓	2
(e)	Find the value of k . 	$k = 360 - 65 - 90 = 205$ ✓	2
(f)	The largest standard paper size is A0. Two A1 sheets can be cut from one A0. Two A2 sheets can be cut from one A1 and so on. How many A4 sheets can be cut from one A0 sheet. A0 1, A3 8 A1 2, A4 16 A2 4 	16 ✓	1
(g)	Name and measure the largest angle in this triangle (to the nearest degree). 	$\hat{RST} = 123^\circ$ ✓	2

(h)	The sides of a quadrilateral are extended to make the angle whose sizes are shown. Find the value of x . 	$360 - (90 + 65 + 105) = 100$ $x = 80$ ✓	1
(i)	A town has 2500 residents of whom 60% voted in an election to fill a council vacancy. The result was that, of those who voted, 38% voted for P, 32% voted for Q and 30% voted for R. Under the voting system, P was elected. Find the number of residents who voted for P. $2500 \times \frac{60}{100} \times \frac{38}{100} = 570$ ✓		2
(j)	Mark works 7 nights per week as a poker machine repair man. He works from 9pm until 3am. He earns \$27 per hour before midnight and \$32.50 per hour after midnight. How much did he earn in a week? $7 \times 3 \times (27 + 32.5) = \1249.50 ✓		2
(k)	In which figure is x not necessarily equal to y . (circle the letter of the correct answer) (A)  (B)  (C)  (D) 		1
(l)	The value of $50!$ is the product of all the whole numbers from 1 to 50 inclusive, i.e. $50! = 50 \times 49 \times 48 \times \dots \times 4 \times 3 \times 2 \times 1$. Find the maximum number of times that 2 will divide into $50!$ exactly. 47 ✓ Working on back		3

$$50! = 1 \times 2 \times 3 \times 4 \times 5 \times 6 \dots 48 \times 49 \times 50$$

- 2 1
- 4 2
- 6 1
- 8 3
- 10 1
- 12 2
- 14 1
- 16 4
- 18 1
- 20 2
- 22 1
- 24 3
- 26 1
- 28 2
- 30 1
- 32 5
- 34 1
- 36 2
- 38 1
- 40 3
- 42 1
- 44 2
- 46 1
- 48 4
- 50 1

47

Question Six (20 Marks)		Answers	Marks
(a)	The number 21 can be expressed as a <u>sum of two or more consecutive positive integers</u> in three different ways, namely $21 = 10 + 11$ $21 = 6 + 7 + 8$ $21 = 1 + 2 + 3 + 4 + 5 + 6$ Find the number of ways 63 can be expressed as such a sum.	$31 + 32$ $20 + 21 + 22$ $8 + 9 + 10 + 11 + 12 + 13$ $6 + 7 + \dots + 12$ $3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 + 11$	3 5
(b)	Some new maths symbols tell us that $P \uparrow$ means $(P+1)$ and $P \downarrow$ means $(P-1)$. Then $(4 \uparrow) \times (3 \downarrow)$ is equal to: (circle the correct answer) (A) $9 \downarrow$ (B) $10 \uparrow$ (C) $11 \downarrow$ (D) $12 \uparrow$ (E) $13 \downarrow$	C	3 C
(c)	If there are 10 people at a party and each person shakes hands with every other person just once, find the number of handshakes. $9 + 8 + 7 + 6 + 5 + 4 + 3 + 2 + 1$	45	3
(d)	A school bus leaves the depot with the driver and one pupil aboard. It picks up pupils at three stops and no pupil gets off the bus until it arrives at school. At each stop, after the first, it picks up twice as many pupils as it did at the previous stop. The number of pupils the bus has on board when it arrives at school could be: (circle the correct answer) $1 + 7 \times c$ (A) 27 (B) 32 (C) 35 (D) 43 (E) 48	D	3
(e)	Graph $x > -4$ on a number line.		2

