Name: ..... Teacher: File

SYDNEY TECHNICAL HIGH SCHOOL

Year 7 Yearly

Mathematics

Examination

2015

Time Allowed: 70 Minutes

Instructions:

- Write your name and teacher at the top of this page.
- These questions must be answered in the space provided.
- Attempt all questions.
- Calculators may not be used.
- Use blue and black pen only.

Question 1	Question 2	Question 3	Question 4	Question 5
/15	/15	/15	/15	/15

Question 6					
a)	b)	c)	d)	e)	TOTAL
/2	/2	/2	/2	/2	/85

Question 1 Directed Number/Intro. Algebra/No. Plane Mark /15

		Marks
a)	Evaluate $7 \times (-3)^2 - 3 \times (-4) =$	1
b)	Evaluate $\frac{-21}{5-7} =$	1
c)	Simplify $(-1)^{101} =$	1
d)	Start with the number -5, add 11 then subtract 20. Multiply the result by 4. What is the result?	1
e)	Put the three numbers 4, -2 and -7 into the boxes below so the answer is -13 ☐ + ☐ - ☐ = -13	1
f)	Place brackets in the statement below to make the statement true 5 + -3 x 3 + 4 = 14	1
g)	In an indoor cricket match, a team has made 25 runs and lost 7 wickets. If a run adds a score of 1 and a wicket subtracts a score of 5, what is the teams final score?	1
h)	Complete the rule for this table by filling in the boxes. $d =$ ☐ x t + ☐	1
i)	The temperature of freezer drops by x^0C every hour. If the temperature at 12 noon is 25^{0}C and $x = 6$, what will be the temperature at 5pm?	1

t	-2	-1	0	1	2
d	4	6	8	10	12

j) The first diagram shows four chairs placed around one square table. The second diagram shows six chairs placed around two square tables. The third diagram shows eight chairs placed around three square tables. Consider the number of chairs needed each time an extra table is added to the row.

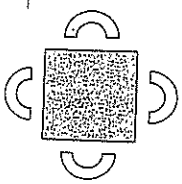


Diagram 1

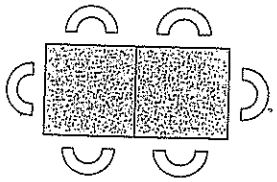


Diagram 2

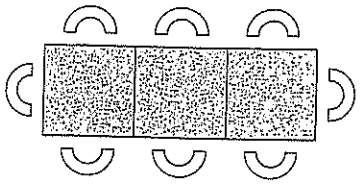


Diagram 3

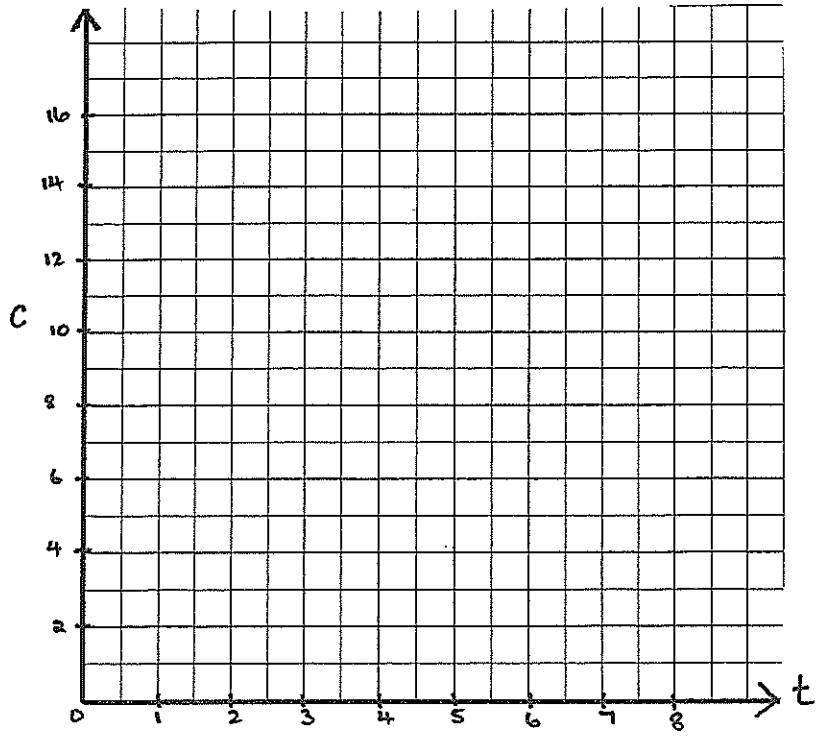
Diagram 1 Diagram 2 Diagram 3

i) Count the number of chairs used to make each diagram, and complete the table below.

Number of tables (t)	1	2	3	4	5	6
Number of chairs (c)	4	6	8			

1

ii) Plot the points (t, c) for values of t from 1 to 6, using your table of values.

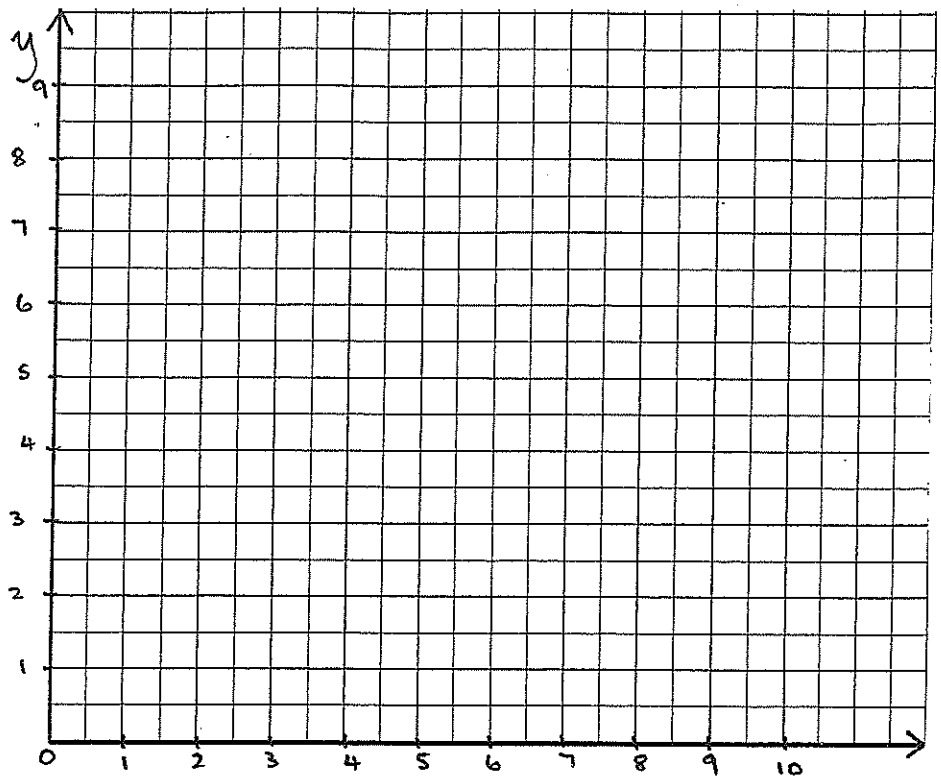


2

iii) Write a rule that tells us the number, c, of chairs we need to place around any number, t, of tables.

C = _____.

1

k)	A parallelogram ABCD has co-ordinates A(1,2), B(4,6) and D(6,2). Plot these points on the number plane below and find the co-ordinates of C.  ∴ C(,)	2

Question 2 Decimals and Percentages Mark /15

		Marks
a)	Arrange from smallest to largest 0.08, $\frac{5}{8}$, $\frac{1}{5}$, 0.9, $\frac{1}{25}$	1
b)	Which of these fractions is closest to 1.45? $1\frac{1}{2}$, $1\frac{33}{50}$, $1\frac{2}{5}$, $\frac{147}{100}$	1
c)	Write $\frac{57}{1000}$ as a decimal	1
d)	Find i) 23.9 ÷ 3.65 ii) 18.6 – 12.97 iii) 31.2 x 0.4 iv) 12.256 ÷ 0.2	4

e)	Convert $\frac{5}{12}$ to a decimal using the correct notation for recurring decimals.	1
f)	i) Round off 2.653 correct to 1 decimal place ii) Round off 4.97 correct to 1 decimal place	1 1
g)	Express \$2.40 as a percentage of \$5.	1
h)	If there are 750 students at a school and 200 are in year 7, what percentage of the school population is in year 7?	1
i)	Find $12\frac{1}{2}$% of 1200	1
j)	The noon temperature at our school for the first week of February were 26.6°C, 26.1°C, 25.8°C, 27.1°C and 25.9°C. Find the average daily noon temperature.	2

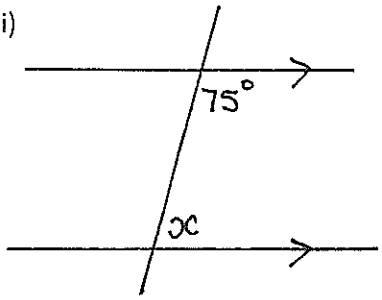
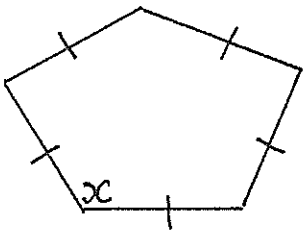
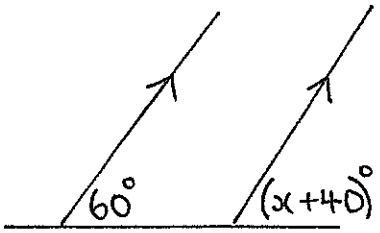
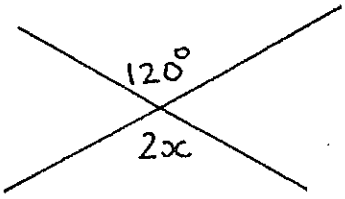
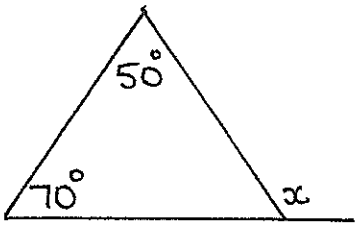
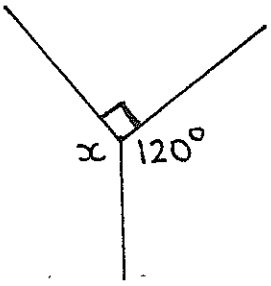
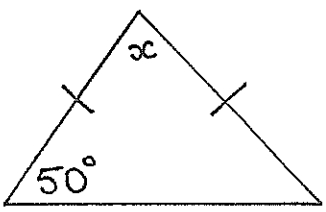
Question 3 Fractions Mark /15

		Marks
a)	Simplify $\frac{18}{27}$ =	1
b)	Find i) $6\frac{1}{3} + 2\frac{1}{4}$ ii) $2\frac{7}{12} - 1\frac{3}{4}$ iii) $4\frac{1}{6} \div \frac{5}{6}$ iv) $1\frac{2}{3} \times 4\frac{1}{2}$	4
c)	Follow the correct order of operations to find $1\frac{1}{3} - \frac{3}{5} \div \frac{6}{11}$	2
d)	What is the sum of $\frac{4}{5}$ and half of $\frac{1}{5}$	2

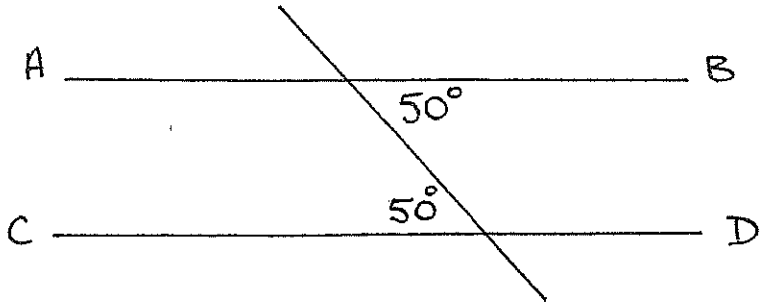
e)	Five-sixths of a farm covers 325 hectares. What is the area of the whole farm?	2
f)	If the product of two numbers is $\frac{5}{8}$ and one of the numbers is $\frac{3}{4}$, find the other number.	2
g)	Ken made 200 meat pies. He sold $\frac{2}{5}$ of them and gave $\frac{1}{4}$ of the remainder to a friend. How many meat pies did he have left?	2

Question 4 Geometry Mark /15

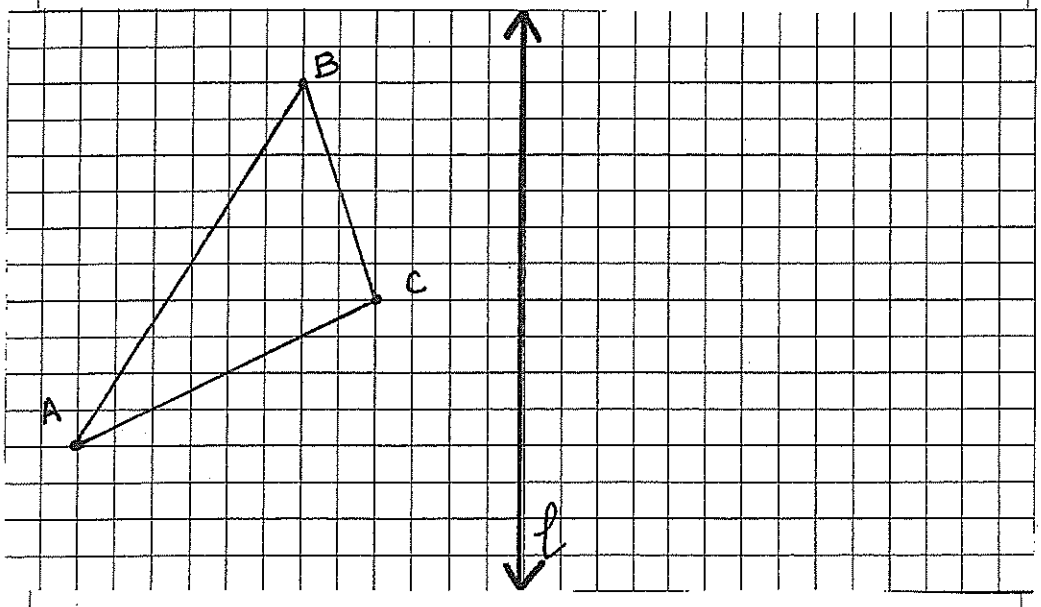
(Angles, Parallel Lines, Flat Shapes and Solids)

		Marks
a)	What is the supplement of 70^0? _____	1
b)	Find the value of the pronumeral in each of the following (a reason is NOT required). (diagrams are NOT to scale) i)  x = _____ ii)  x = _____ iii)  x = _____ iv)  x = _____ v)  x = _____ vi)  x = _____ vii)  x = _____	7

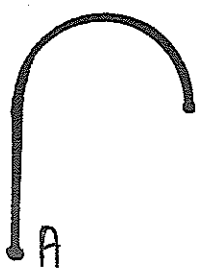
c) Explain in words why AB is parallel to CD — 1

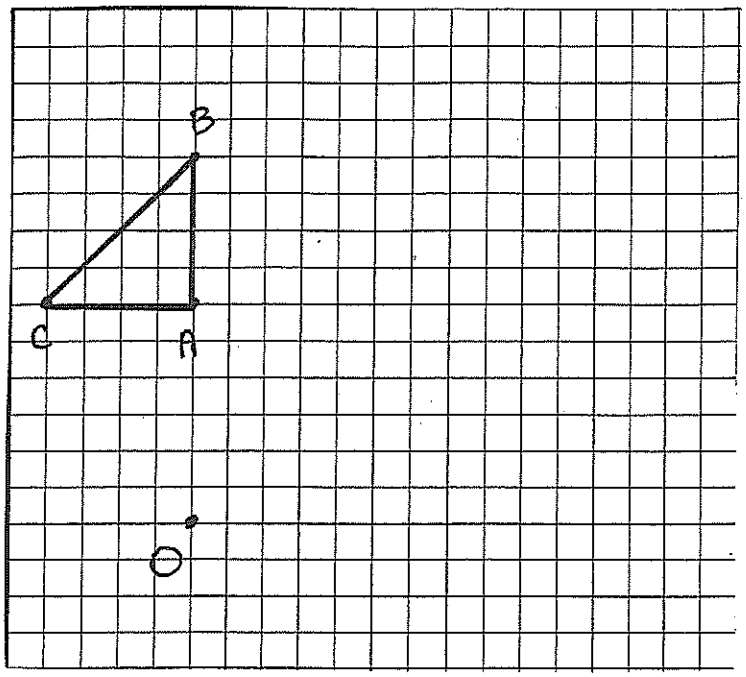
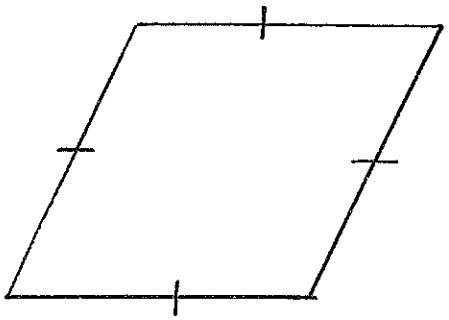
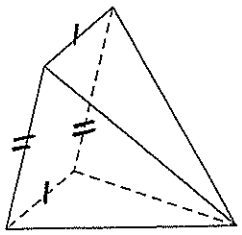


d) Reflect triangle ABC across the line ℓ. Label your image A' B' C' — 1

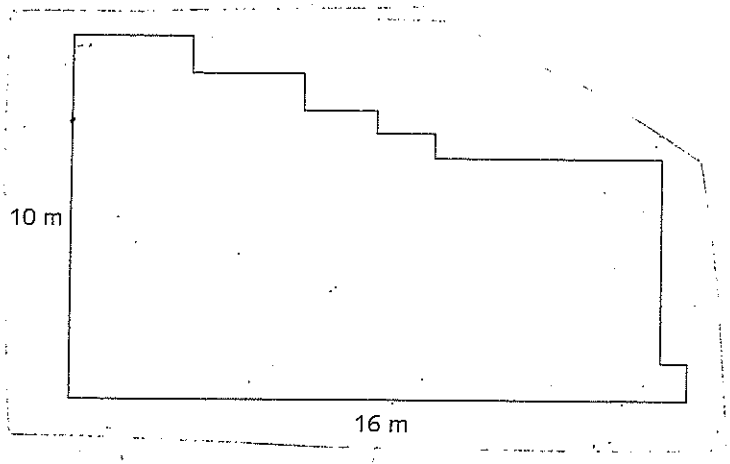
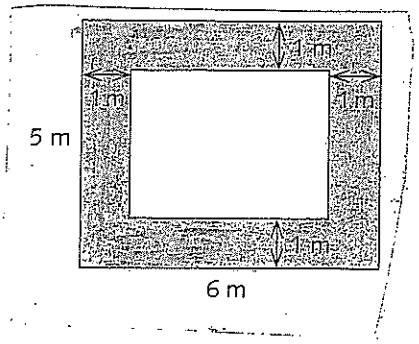
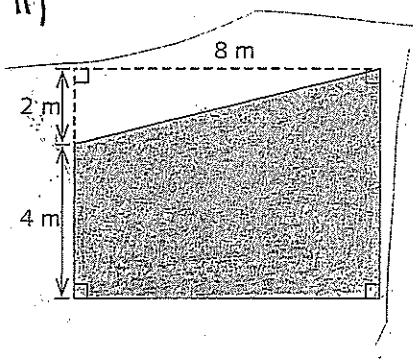


e) Complete this figure if it is to have point symmetry around the point A. — 1



f)	Rotate the triangle ABC 90^0 in a clockwise direction with O as the centre of rotation. Label your rotated figure A' B' C' correctly.  	1
g)	Name this figure (it is not drawn to scale).  _____	1
h)	 i) Name this solid _____ ii) Show that FACES + VERTICES – EDGES = 2 _____ _____	2

Question 5 Measurement Mark /15

		Marks
a)	Complete the following i) 4.8g = _____ kg ii) 2.3kL= _____ litres iii) 55cm = _____ m iv) 1607mm = _____ m v) 2 hectares = _____ m^2	5
b)	Without measuring, find the perimeter of the figure below. (all angles are 90^0, and figure is not drawn to scale) 	1
c)	Find the area of each shaded region. i)  area = _____ _____ _____ ii)  area = _____ _____ _____	2

d)	Find the volume of a right rectangular prism with dimensions 5.2cm x 6cm x 10cm. _____ _____	1
e)	If I started a train trip at 14:30 and finished it at 06:25 the next day, how long did the journey take? _____ _____	1
f)	Elephants often weighs as much as 3 tonnes, while the heaviest mass a person can lift (usually in the Olympic games) is about 250kg. what is the minimum number of people needed to lift an elephant? _____ _____	1
g)	The time zone difference from Melbourne to Los Angeles is 19 hours, Melbourne being ahead in time. What time would it be in Melbourne if it were 6:27 a.m. on Tuesday in Los Angeles? _____ _____	1
h)	A right rectangular prism has volume 625 mm^3. The height of the prism is 12.5 cm. Find the area of the base. _____ _____	1
i)	If 200m^2 of grass is required for the healthy grazing of 3 sheep i) How much grass is needed to raise 15 sheep? _____ _____ ii) How many healthy sheep can 2.5 hectares of land support? _____ _____	2

Question 6 Extension Questions

Marks

a)

2	-5	0
		-4

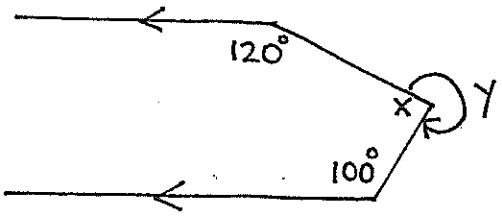
Complete this magic square, so that all rows, columns and diagonals have the same sum. — 2

b) Using the digits 5, 6, 7 and 8 once only fill in the spaces to make the product below as large as possible. — 2

0. ____ X 0. ____ ____ ____

c) Find $1 + \frac{1}{1+\frac{1}{2}} =$ — 2

d) Find x and y (reasons not required) — 2

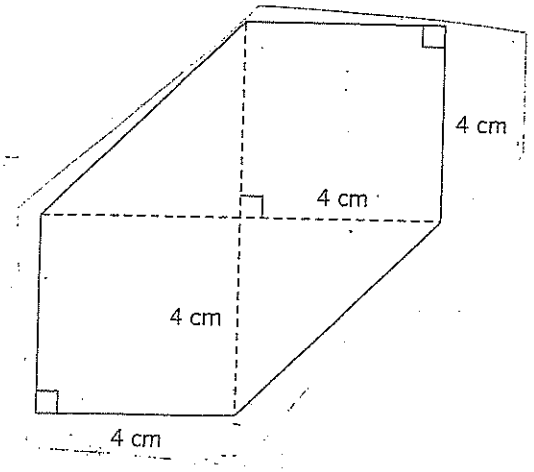


$X =$ _____

$Y =$ _____

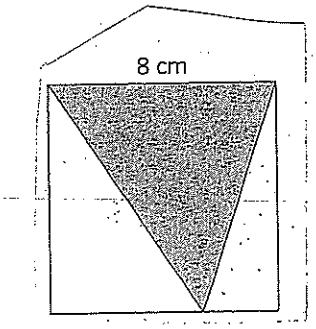
e) — 2

i) Find the area of the following figure



Area = _____

ii) A square of side length 8cm has a triangle removed. What is the remaining area?



Area = _____

Name: Solutions Teacher: .....

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Question 1	Question 2	Question 3	Question 4	Question 5	
/15	/15	/15	/15	/15	
Question 6					
a)	b)	c)	d)	e)	TOTAL
/2	/2	/2	/2	/2	/85

Question 1 Directed Number/Intro. Algebra/No. Plane Mark /15

		Marks
a)	Evaluate $7 \times (-3)^2 - 3 \times (-4) =$ 75	1
b)	Evaluate $\frac{-21}{5-7} =$ $10\frac{1}{2}$	1
c)	Simplify $(-1)^{101} =$ -1	1
d)	Start with the number -5, add 11 then subtract 20. Multiply the result by 4. What is the result? _____ -56	1
e)	Put the three numbers 4, -2 and -7 into the boxes below so the answer is -13 $\boxed{-2} + \boxed{-7} - \boxed{4} = -13$ or $-7+-2-4$	1
f)	Place brackets in the statement below to make the statement true $(5 + -3) \times (3 + 4) = 14$	1
g)	In an indoor cricket match, a team has made 25 runs and lost 7 wickets. If a run adds a score of 1 and a wicket subtracts a score of 5, what is the teams final score? -10	1
h)	Complete the rule for this table by filling in the boxes.	1
i)	The temperature of freezer drops by x^0C every hour. If the temperature at 12 noon is 25°C and $x = 6$, what will be the temperature at 5pm? $-5^\circ C$	1

t	-2	-1	0	1	2
d	4	6	8	10	12

$d = \boxed{2} \times t + \boxed{8}$

j) The first diagram shows four chairs placed around one square table. The second diagram shows six chairs placed around two square tables. The third diagram shows eight chairs placed around three square tables. Consider the number of chairs needed each time an extra table is added to the row.

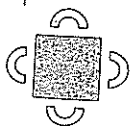


Diagram 1

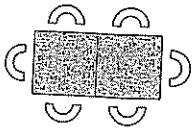


Diagram 2

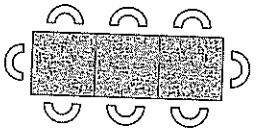


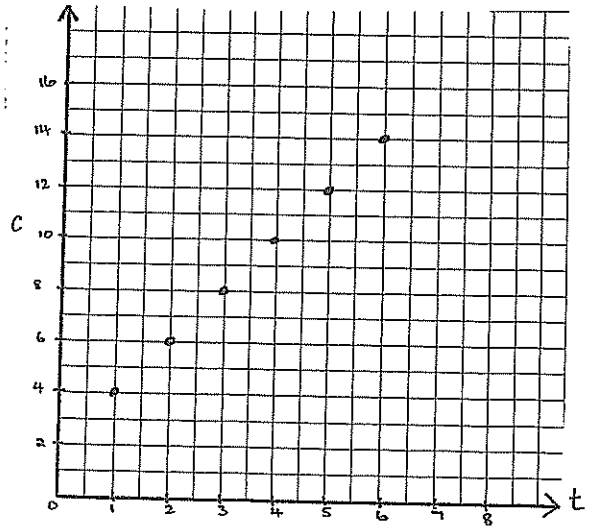
Diagram 3

Diagram 1 Diagram 2 Diagram 3

i) Count the number of chairs used to make each diagram, and complete the table below. 1

Number of tables (t)	1	2	3	4	5	6
Number of chairs (c)	4	6	8	10	12	14

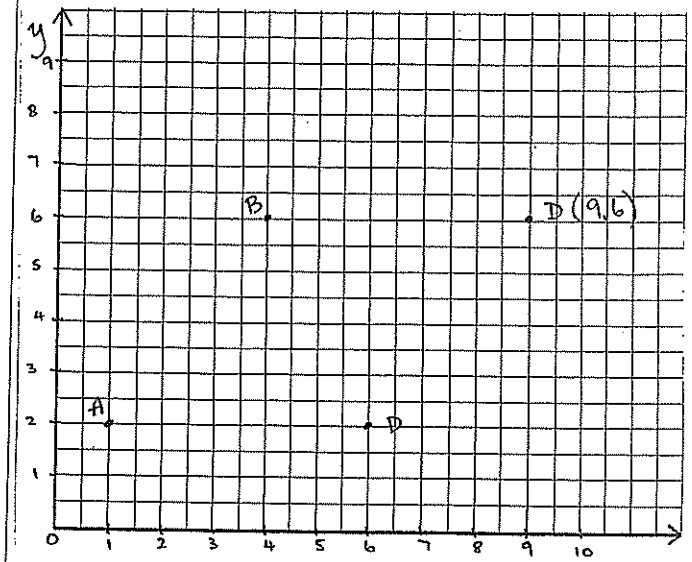
ii) Plot the points (t, c) for values of t from 1 to 6, using your table of values. 2



iii) Write a rule that tells us the number, c, of chairs we need to place around any number, t, of tables. 1

$c = 2 \times t + 2$

k) A parallelogram ABCD has co-ordinates A(1,2), B(4,6) and D(6,2). Plot these points on the number plane below and find the co-ordinates of C. 2



$\therefore C(9, 6)$

Question 2 Decimals and Percentages Mark /15

		Marks
a)	Arrange from smallest to largest 0.08, $\frac{5}{8}$, $\frac{1}{5}$, 0.9, $\frac{1}{25}$ $\frac{1}{25}$, 0.08, $\frac{1}{5}$, $\frac{5}{8}$, 0.9	1
b)	Which of these fractions is closest to 1.45? $1\frac{1}{2}$, $1\frac{33}{50}$, $1\frac{2}{5}$, $\frac{147}{100}$ $\frac{147}{100}$	1
c)	Write $\frac{57}{1000}$ as a decimal .057	1
d)	Find i) 23.9 + 3.65 27.55 ii) 18.6 – 12.97 5.63 iii) 31.2 x 0.4 12.48 iv) 12.256 ÷ 0.2 61.28	4

e)	Convert $\frac{5}{12}$ to a decimal using the correct notation for recurring decimals. $0.41\dot{6}$	1
f)	i) Round off 2.653 correct to 1 decimal place 2.7 ii) Round off 4.97 correct to 1 decimal place 5.0	1 1
g)	Express \$2.40 as a percentage of \$5. 48%	1
h)	If there are 750 students at a school and 200 are in year 7, what percentage of the school population is in year 7? $26\frac{2}{3}$%	1
i)	Find $12\frac{1}{2}$% of 1200 150	1
j)	The noon temperature at our school for the first week of February were 26.6°C, 26.1°C, 25.8°C, 27.1°C and 25.9°C. Find the average daily noon temperature. 26.6 26.1 25.8 27.1 25.9 131.5 26.3°C	2

Question 3 Fractions Mark /15

		Marks
a)	Simplify $\frac{18}{27}$ = $\frac{2}{3}$	1
b)	Find i) $6\frac{1}{3} + 2\frac{1}{4}$: $8\frac{7}{12}$ ii) $2\frac{7}{12} - 1\frac{3}{4}$: $\frac{5}{6}$ iii) $4\frac{1}{6} \div \frac{5}{6}$: 5 iv) $1\frac{2}{3} \times 4\frac{1}{2}$: $7\frac{1}{2}$	4
c)	Follow the correct order of operations to find $1\frac{1}{3} - \frac{3}{5} \div \frac{6}{11}$ $= \frac{4}{3} - \left(\frac{3}{5} \times \frac{11}{6}\right)$ $= \frac{4}{3} - \frac{11}{10}$ $= \frac{40 - 33}{30}$ $= \frac{7}{30}$	2
d)	What is the sum of $\frac{4}{5}$ and half of $\frac{1}{5}$ $\frac{4}{5} + \frac{1}{10}$ $\frac{8}{10} + \frac{1}{10}$ $= \frac{9}{10}$	2

e)	Five-sixths of a farm covers 325 hectares. What is the area of the whole farm? $\frac{5}{6}$ is 325 hectares $\therefore \frac{1}{6}$ is 65 hect. $\therefore$ farm is $\frac{6}{6}$ 390 hectares	2
f)	If the product of two numbers is $\frac{5}{8}$ and one of the numbers is $\frac{3}{4}$, find the other number. $\square \times \frac{3}{4} = \frac{5}{8}$ $\square = \frac{5}{8} \div \frac{3}{4}$ $\square = \frac{5}{8_2} \times \frac{4^1}{3}$ $\square = \frac{5}{6}$	2
g)	Ken made 200 meat pies. He sold $\frac{2}{5}$ of them and gave $\frac{1}{4}$ of the remainder to a friend. How many meat pies did he have left? Sold $\Rightarrow \frac{2}{5} \times 200 = 80$ $\therefore$ had 120 left give $\frac{1}{4} \times 120 = 30$ to friend $\therefore$ had 90 left	2

Question 4 Geometry Mark /15

(Angles, Parallel Lines, Flat Shapes and Solids)

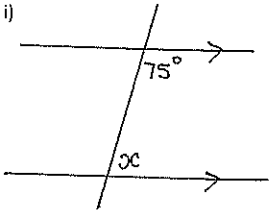
Marks

a) What is the supplement of 70^0? **1**

110^0

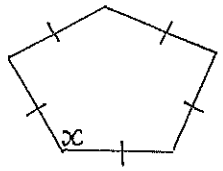
b) Find the value of the pronumeral in each of the following (a reason is NOT required). (diagrams are NOT to scale)

i)



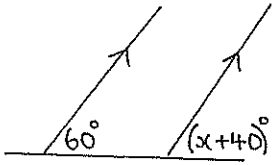
$x = 105^0$

ii)



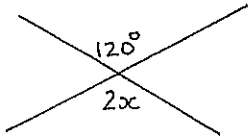
$x = 108^0$

iii)



$x = 20^0$

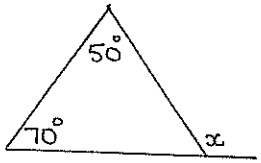
iv)



$x = 60^0$

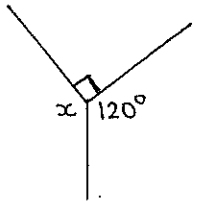
7

v)



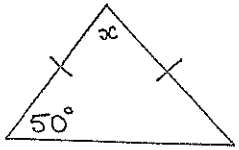
$x = 120^0$

vi)



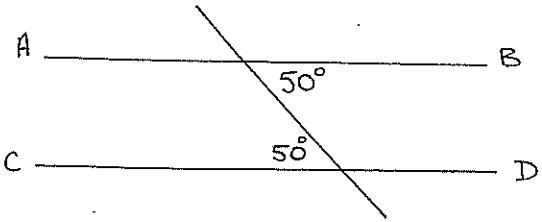
$x = 150^0$

vii)



$x = 80^0$

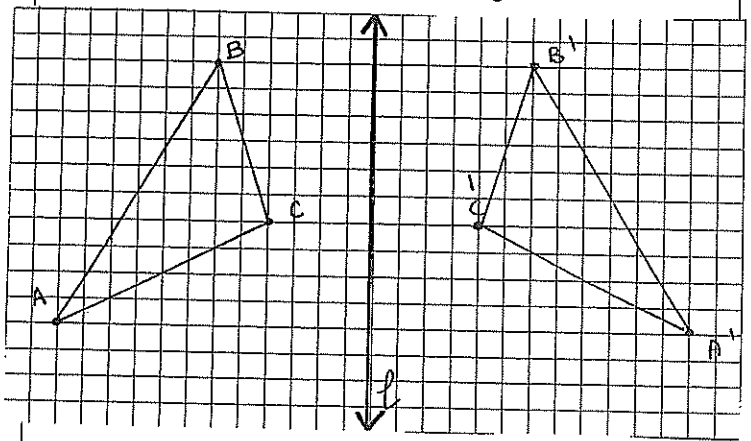
c) Explain in words why AB is parallel to CD **1**



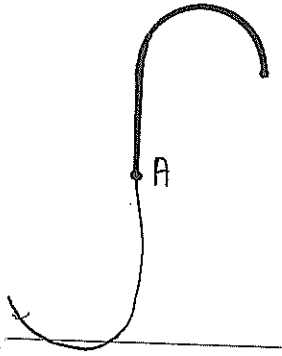
alternate angles are equal

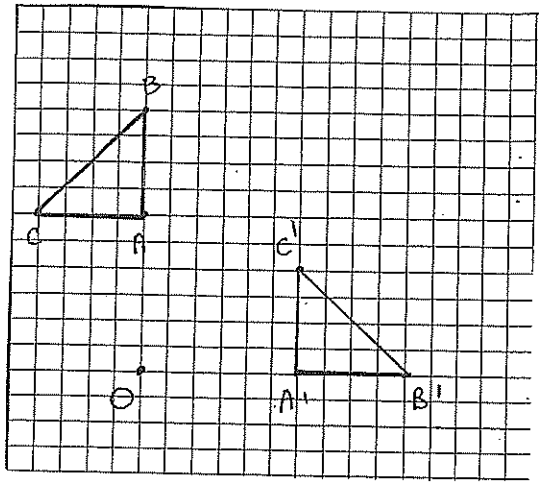
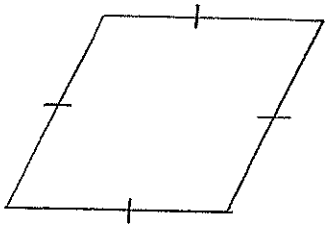
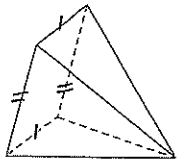
$\therefore$ AB // CD

d) Reflect triangle ABC across the line ℓ. Label your image A' B' C' **1**

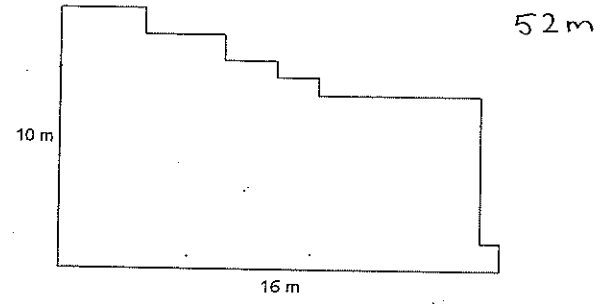
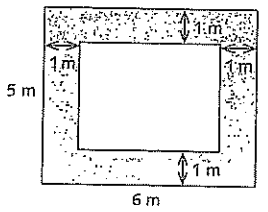
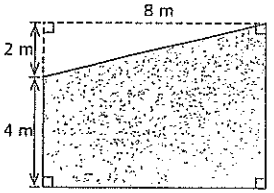


e) Complete this figure if it is to have point symmetry around the point A. **1**



f)	Rotate the triangle ABC 90° in a clockwise direction with O as the centre of rotation. Label your rotated figure A' B' C' correctly. 	1
g)	Name this figure (it is not drawn to scale).  rhombus	1
h)	 i) Name this solid rectangular pyramid ii) Show that FACES + VERTICES – EDGES = 2 5 + 5 – 8 = 2	2

Question 5 Measurement Mark /15

		Marks
a)	Complete the following i) 4.8g = .0048 kg ii) 2.3kL = 2300 litres iii) 55cm = .55 m iv) 1607mm = 1.607 m v) 2 hectares = 20,000 m²	5
b)	Without measuring, find the perimeter of the figure below. (all angles are 90°, and figure is not drawn to scale) 	1
c)	Find the area of each shaded region. i)  area = 30 – (3×4) = 18m² ii)  area = $\frac{48 - 1 \cdot 2 \cdot 8}{2}$ 40m²	2

d)	Find the volume of a right rectangular prism with dimensions 5.2cm x 6cm x 10cm. $5.2 \times 6 \times 10 = 312\,cm^3$	1
e)	If I started a train trip at 14:30 and finished it at 06:25 the next day, how long did the journey take? 15hrs 55min	1
f)	Elephants often weighs as much as 3 tonnes, while the heaviest mass a person can lift (usually in the Olympic games) is about 250kg. what is the minimum number of people needed to lift an elephant? 12	1
g)	The time zone difference from Melbourne to Los Angeles is 19 hours, Melbourne being ahead in time. What time would it be in Melbourne if it were 6:27 a.m. on Tuesday in Los Angeles? 1:27am	1
h)	A right rectangular prism has volume 625 mm³. The height of the prism is 12.5 cm. Find the area of the base. $5mm^2$	1
i)	If 200m² of grass is required for the healthy grazing of 3 sheep i) How much grass is needed to raise 15 sheep? $1000m^2$ ii) How many healthy sheep can 2.5 hectares of land support? 25000 / 1000 $25 \times 15 = 375$ sheep	2

Question 6 Extension Questions Mark /15

		Marks
a)	Complete this magic square, so that all rows, columns and diagonals have the same sum. 2 -5 0 -3 -1 1 -2 3 -4	2
b)	Using the digits 5, 6, 7 and 8 once only fill in the spaces to make the product below as large as possible. 0.8 x 0.765	2
c)	Find $1 + \frac{1}{1+\frac{1}{2}} =$ $1 + \frac{1}{3/2}$ $1 + \frac{2}{3}$ $1\frac{2}{3}$	2
d)	Find *x* and *y* (reasons not required) 120°, 100°, x, y x = 140° y = 220°	2
e)	i) Find the area of the following figure 4 cm, 4 cm, 4 cm Area = $(2 \times 16) + 2(\frac{1}{2} \times 4 \times 4)$ $= 48\,cm^2$ ii) A square of side length 8cm has a triangle removed. What is the remaining area? 8 cm Area = $64 - \frac{1}{2} \times 8 \times 8$ $= 32\,cm^2$	2