Name: ..... FILE ..... **Maths Teacher:** .....

SYDNEY TECHNICAL HIGH SCHOOL

Year 7
Mathematics

Assessment 3

October, 2016

Time allowed: 70 minutes

General Instructions:

- Marks for each question are indicated on the question.
- All necessary working should be shown
- Full marks may not be awarded for careless work or illegible writing
- Write using black or blue pen
- All answers are to be written neatly in the spaces provided

		Extension
1. Number	/15	/5
2. Patterns and Algebra	/15	/5
3. Geometry and Plane Shapes	/15	/5
4. Measurement	/15	/5
5. Extension		/20
TOTAL		/80

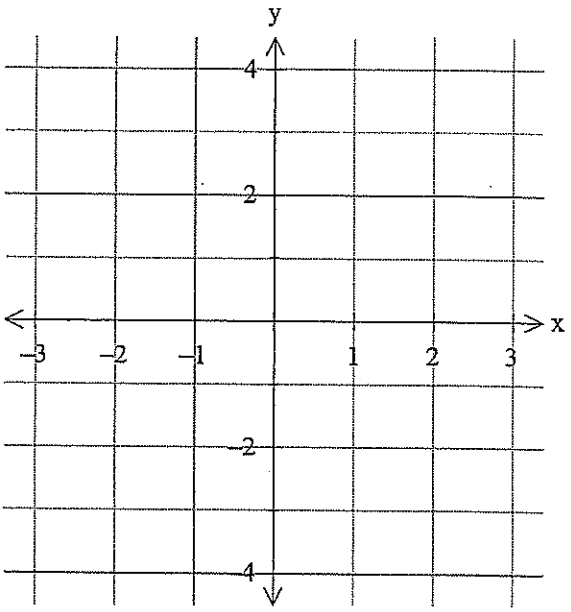
Question 1: Number *Marks: 15*

Questions			Solutions
a)	Evaluate: $3 - 2 \times -3 =$	**(1)**	
b)	Evaluate: $23.9 + 17.4 =$	**(1)**	
c)	$12.1 \times 2.5 =$	**(1)**	
d)	$15.862 \div 0.2 =$	**(1)**	
e)	$78.101 - 9.48 =$	**(1)**	
f)	Simplify: $(-1)^{123} + (-1)^{1230} =$	**(1)**	
g)	Write $\frac{127}{100}$ as a percentage	**(1)**	
h)	Convert $\frac{7}{12}$ to a decimal, using the correct notation for recurring decimals	**(1)**	

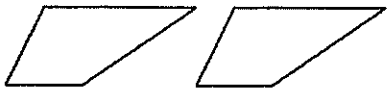
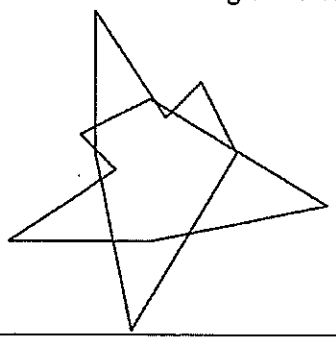
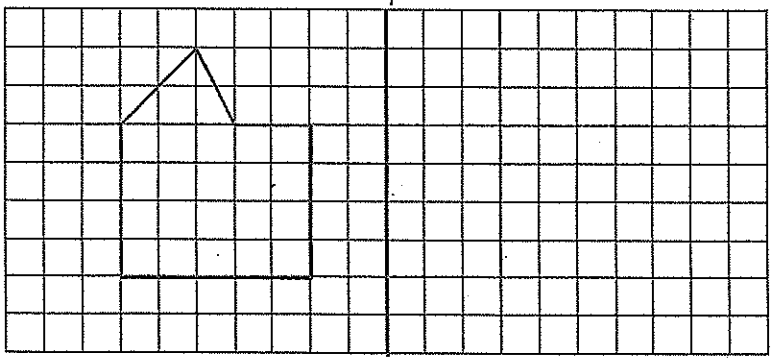
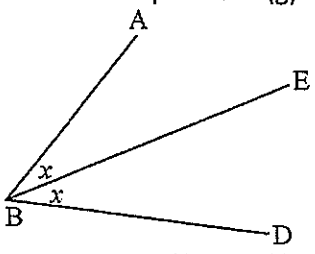
i)	Simplify: $1\frac{1}{9}+2\frac{4}{5}=$ **(1)**	
j)	$5\frac{3}{8}-1\frac{3}{4}=$ **(1)**	
k)	$3\frac{3}{4}\times\frac{16}{27}=$ **(1)**	
l)	$7\div\frac{1}{7}=$ **(1)**	
m)	Round 12.03489 to the nearest hundredth **(1)**	
n)	Round 90.155 to one decimal place **(1)**	
o)	Find 15% of 120 **(1)**	

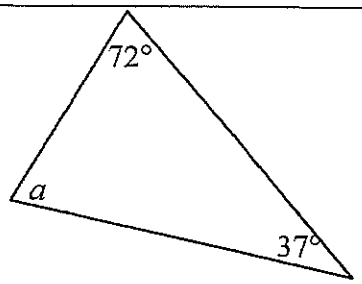
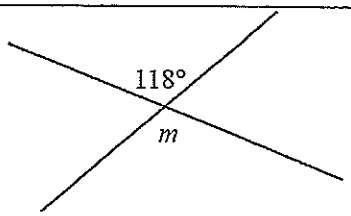
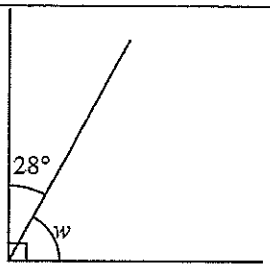
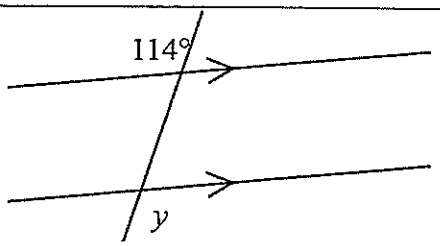
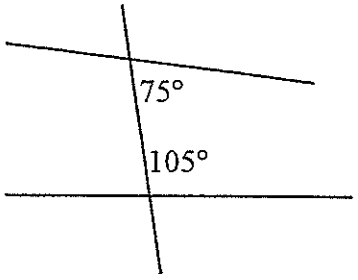
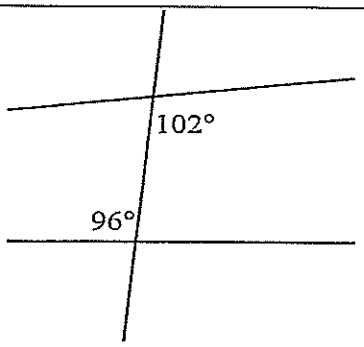
Question 2: Patterns and Algebra *Marks: 15*

Questions			Solutions
a)	The following 3 questions refer to the diagram below:  Figure 1 Figure 2 Fill in Figure 3	**(1)**	Figure 3
b)	How many matches would be required for Figure 9?	**(1)**	
c)	Write the formula for the number of matches that would be needed to make Figure F of the pattern	**(1)**	
d)	Simplify $a + a + a + b + b$	**(1)**	
e)	$a \times a \times a \times b \times b$	**(1)**	
f)	$3x - 4y - 4x + 5y^2$	**(1)**	
g)	$-\frac{x}{3} - \left(-\frac{2x}{6}\right)$	**(1)**	
h)	If $x = 3$ and $y = -1$ evaluate (h), (I) and (j): $x(x + y)$	**(1)**	
i)	$x^2 - y$	**(1)**	
j)	$\frac{x}{y^2}$	**(1)**	

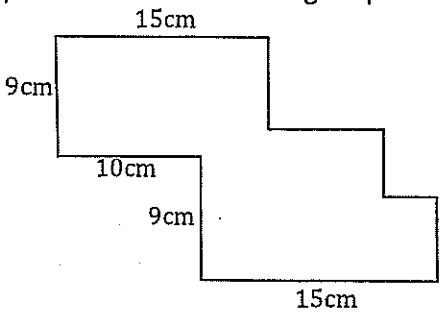
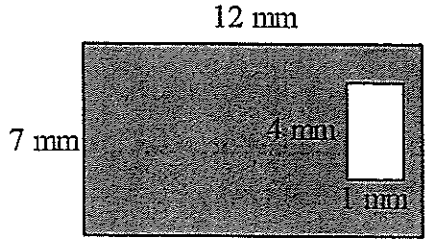
k)	What is the rule for the following table: **(1)** t | 1 | 2 | 3 | 4 | 5 | 6 h | 1 | 4 | 7 | 10 | 13 | 16	
l)	Solve $x + 3 = 7$ **(1)**	
m)	Solve $3d - 4 = 2$ **(1)**	
n)	Fill in the table of values using the expression $y = x - 1$ **(1)**	x | -2 | -1 | 0 | 1 | 2 y | | | | |
o)	Using the table of values from the previous question, graph $y = x - 1$ **(1)**	

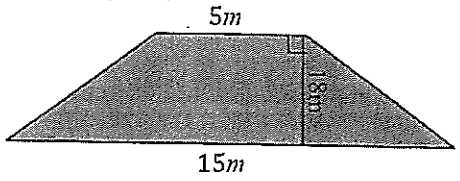
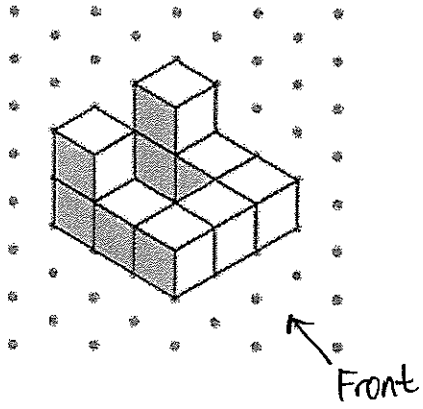
Question 3: Geometry and Plane Shapes *Marks: 15*

	Questions	Solutions
a)	Name the following transformation: **(1)** 	
b)	Name the following transformation: **(1)** 	
c)	Draw the reflection of the figure across the line **(1)** 	
d)	What shape am I? **(1)** I am a three sided figure with all angles 60°	
e)	What shape am I? **(1)** I am a four-sided figure with 2 pairs of parallel sides	
f)	Angles that add up to 180° are said to be... **(1)**	
g)	Find the values of the pronumerals below, you do not have to provide reasons for questions (g) – (k). **(1)**  $\angle ABD = 68°$	

h)		**(1)**	
i)		**(1)**	
j)		**(1)**	
k)		**(1)**	
l)	Are the following lines parallel? **Give reasons as to why** for questions (l)-(m). 	**(2)**	
m)		**(2)**	

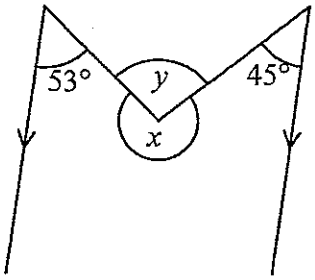
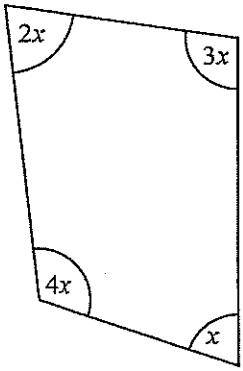
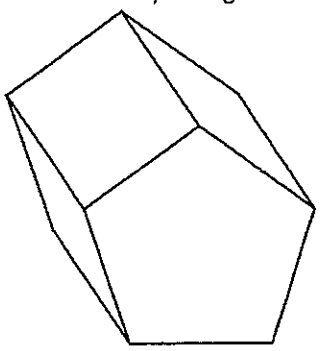
Question 4: Measurement *Marks: 15*

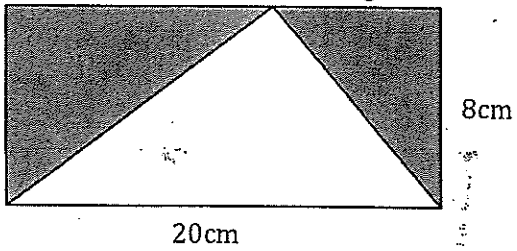
Questions			Solutions
a)	Convert the following units: 1.1kg into grams	**(1)**	
b)	0.239mL into litres	**(1)**	
c)	53km into millimetres	**(1)**	
d)	30 500m^2 into hectares	**(1)**	
e)	Turn 3:30pm into 24-hour time	**(1)**	
f)	If Amie watched the news from 7:25am-8:15am and 6:05pm-6:50pm, how many hours of news did she watch altogether?	**(1)**	
g)	Without measuring, find the perimeter of the following shape: 	**(1)**	
h)	Find the shaded area of the following shape: 	**(1)**	

i)	Find the shaded area of the following shape: **(1)** 		
j)	Madrid is 10 hours behind Sydney. If it is currently 3am, Saturday, 8th October in Sydney, what would the time and date be in Madrid? **(2)**		
k)	Find the volume of a cube with side length 2.3cm **(1)**		
l)	If an elevator can carry 1230kg safely, how many people can fit at one time, assuming the average person weighs 80kg? **(1)**		
m)	Draw the top and front view of the following solid: **(2)** 	Top view	Front view

Question 5: Extension *Marks: 20*

Questions			Solutions
Number			
a)	If the average of 4 numbers is 15, what would the fifth number have to be to lower the average to 14	**(1)**	
b)	Calculate: $\frac{10-0.6}{(0.3)^2}$	**(2)**	
c)	Between which two consecutive whole numbers does $\sqrt{12}$ lie?	**(2)**	
Patterns and Algebra			
d)	If $p=\frac{1}{3}$ and $q=-\frac{1}{3}$ Solve for: $\frac{1}{p}-\frac{p}{q}$	**(1)**	
e)	What must be added to $b-3a$ to give a solution of a?	**(1)**	
f)	If the sum of three consecutive integers is 93, write an equation that could be used to solve for the three numbers. (Hint: let the smallest number be x)	**(1)**	

g)	By using the equation from part (f), solve for the three numbers. **(1)**	
h)	Marcus and Sara's combined age is 30. Given that Sara is 2 years older than Marcus, find Marcus' age. **(1)**	
Geometry and Plane Shapes		
i)	Find x and y. Reasons are not required. **(2)** 	
j)	Solve for x. Reasons are not required. **(1)** 	
k)	Name this prism and show that Euler's Rule holds by filling in the blanks. **(2)** 	Name:_____ Faces+Vertices=_____ Edges+2 =_____

Measurement			
l)	If a rectangular prism has a volume of $450cm^3$ and has a width of 10cm and a length of 9cm, find its height.	**(1)**	
m)	There is a 10-hour time difference between Paris and Sydney. Sandy is in Sydney and wants to call Louis in Paris. If she wants to reach Louis at 8am Paris-time, what time will Sandy need to make the call in Sydney-time?	**(1)**	
n)	The following rectangle has a triangle cut out of it. What is the remaining area?  	**(1)**	
o)	Paddy is given 60 pieces of 1m fencing. What are the dimensions of the largest area he can enclose?	**(2)**	

Name: Solutions Maths Teacher: .....

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Assessment 3

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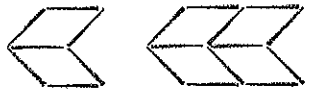
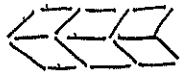
		Extension
1. Number	/15	/5
2. Patterns and Algebra	/15	/5
3. Geometry and Plane Shapes	/15	/5
4. Measurement	/15	/5
5. Extension		/20
TOTAL		/80

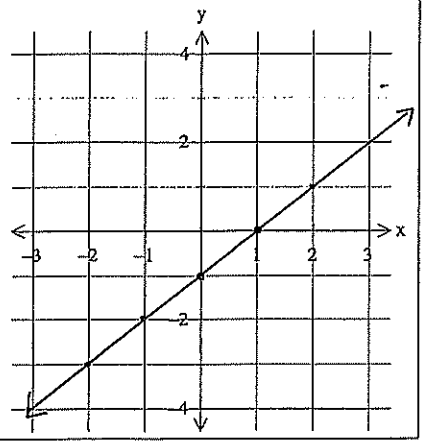
Question 1: Number *Marks: 15*

Questions			Solutions
a)	Evaluate: $3 - 2 \times -3 =$	(1)	9
b)	Evaluate: $23.9 + 17.4 =$	(1)	41.3
c)	$12.1 \times 2.5 =$	(1)	30.25
d)	$15.862 \div 0.2 =$	(1)	79.31
e)	$78.101 - 9.48 =$	(1)	68.621
f)	Simplify: $(-1)^{123} + (-1)^{1230} =$	(1)	0
g)	Write $\frac{127}{100}$ as a percentage	(1)	127%
h)	Convert $\frac{7}{12}$ to a decimal, using the correct notation for recurring decimals	(1)	$0.58\dot{3}$

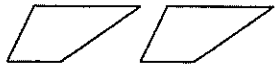
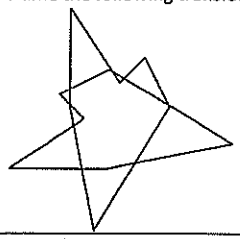
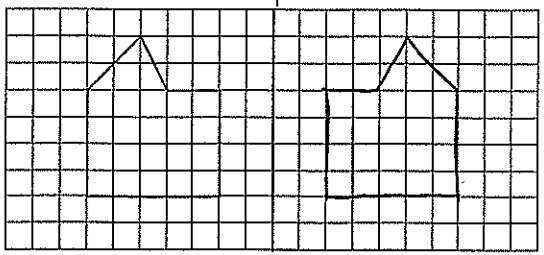
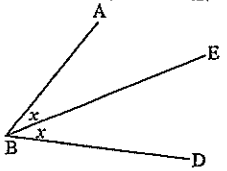
i)	Simplify: $1\frac{1}{9}+2\frac{4}{5}=$	(1)	$3\frac{41}{45}$
j)	$5\frac{3}{8}-1\frac{3}{4}=$	(1)	$3\frac{5}{8}$
k)	$3\frac{3}{4}\times\frac{16}{27}=$	(1)	$\frac{20}{9}$ OR $2\frac{2}{9}$
l)	$7\div\frac{1}{7}=$	(1)	49
m)	Round 12.03489 to the nearest hundredth	(1)	12.03
n)	Round 90.155 to one decimal place	(1)	90.2
o)	Find 15% of 120	(1)	18

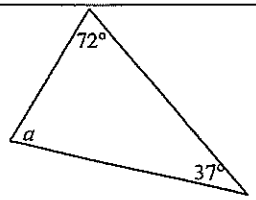
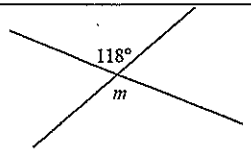
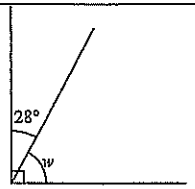
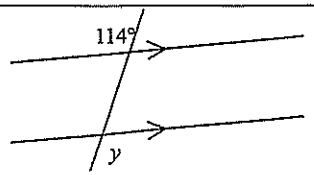
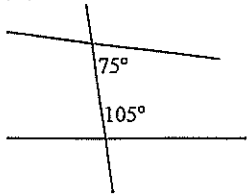
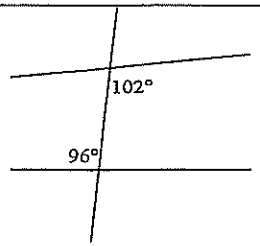
Question 2: Patterns and Algebra *Marks: 15*

Questions			Solutions
a)	The following 3 questions refer to the diagram below:  Figure 1 Figure 2 Fill in Figure 3	(1)	 Figure 3
b)	How many matches would be required for Figure 9?	(1)	47
c)	Write the formula for N, the number of matches that would be needed to make Figure F of the pattern	(1)	$F=5N+2$
d)	Simplify $a+a+a+b+b$	(1)	$3a+2b$
e)	$a\times a\times a\times b\times b$	(1)	a^3b^2
f)	$3x-4y-4x+5y^2$	(1)	$-x-4y+5y^2$
g)	$-\frac{x}{3}-\left(-\frac{2x}{6}\right)$	(1)	0
h)	If $x=3$ and $y=-1$ evaluate (h), (i) and (j): $x(x+y)$	(1)	6
i)	x^2-y	(1)	10
j)	$\frac{x}{y^2}$	(1)	3

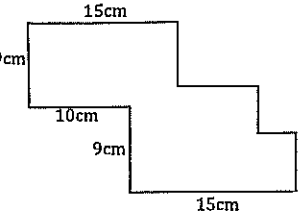
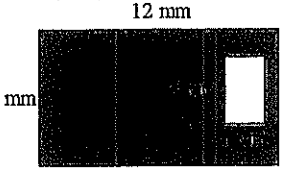
k)	What is the rule for the following table: (1) f: 1 2 3 4 5 6 h: 1 4 7 10 13 16	$h = 3f - 2$
l)	Solve $x + 3 = 7$ (1)	$x = 4$
m)	Solve $3d - 4 = 2$ (1)	$d = 2$
n)	Fill in the table of values using the expression $y = x - 1$ (1)	x: -2 -1 0 1 2 y: -3 -2 -1 0 1
o)	Using the table of values from the previous question, graph $y = x - 1$ (1)	

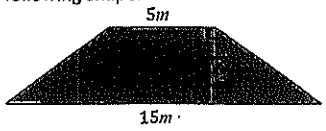
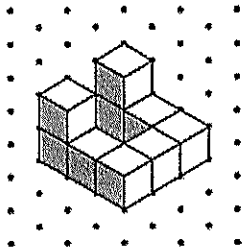
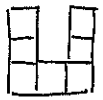
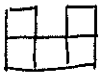
Question 3: Geometry and Plane Shapes *Marks: 15*

	Questions	Solutions
a)	Name the following transformation: (1) 	Translation
b)	Name the following transformation: (1) 	Rotation
c)	Draw the reflection of the figure across the line (1) 	
d)	What shape am I? (1) I am a three sided figure with all angles 60°	Equilateral Triangle
e)	What shape am I? (1) I am a four-sided figure with 2 pairs of parallel sides	Parallelogram, Rhombus, Rectangle, Square
f)	Angles that add up to 180° are said to be... (1)	Supplementary
g)	Find the values of the pronumerals below, you do not have to provide reasons for questions (g) – (k). (1)  $\angle ABD = 68°$	$x = 34°$

h)		(1)	$a = 71°$
i)		(1)	$m = 118°$
j)		(1)	$w = 62°$
k)		(1)	$y = 114°$
l)	Are the following lines parallel? **Give reasons as to why for questions (l)-(m).** 	(2)	Parallel Co-interior angles are supplementary.
m)		(2)	Not Parallel alternate angles are NOT equal

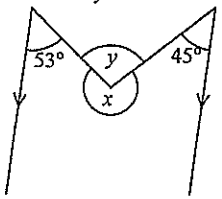
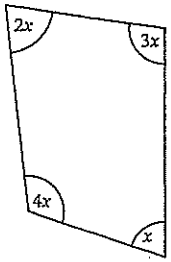
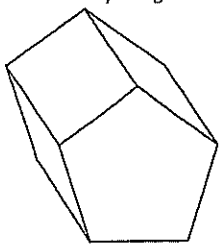
Question 4: Measurement *Marks: 15*

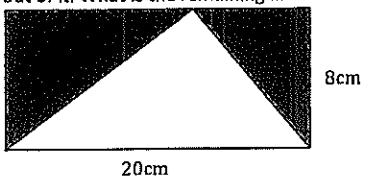
Questions			Solutions
a)	Convert the following units: 1.1kg into grams	(1)	1100g
b)	0.239mL into litres	(1)	0.000239L
c)	53km into millimetres	(1)	53 000 000 mm
d)	30 500m^2 into hectares	(1)	3.05hq
e)	Turn 3:30pm into 24-hour time	(1)	15:30
f)	If Amie watched the news from 7:25am-8:15am and 6:05pm-6:50pm, how many hours of news did she watch altogether?	(1)	1hr 35minutes
g)	Without measuring, find the perimeter of the following shape: 	(1)	86 cm
h)	Find the shaded area of the following shape: 	(1)	80 mm^2

i)	Find the shaded area of the following shape: (1) 	$180m^2$	
j)	Madrid is 10 hours behind Sydney. If it is currently 3am, Saturday, 8th October in Sydney, what would the time and date be in Madrid? (2)	5pm Friday 7th October	
k)	Find the volume of a cube with side length 2.3cm (1)	$12.167cm^3$	
l)	If an elevator can carry 1230kg safely, how many people can fit at one time, assuming the average person weighs 80kg? (1)	15 people	
m)	Draw the top and front view of the following solid: (2) 	Top view 	Front view 

Question 5: Extension *Marks: 20*

Questions			Solutions
Number			
a)	If the average of 4 numbers is 15, what would the fifth number have to be to lower the average to 14	(1)	10
b)	Calculate: $\frac{10-0.6}{(0.3)^2}$.	(2)	$\frac{940}{9}$ OR $104.\dot{4}$
c)	Between which two consecutive whole numbers does $\sqrt{12}$ lie?	(2)	3 and 4
Patterns and Algebra			
d)	If $p=\frac{1}{3}$ and $q=-\frac{1}{3}$ Solve for: $\frac{1}{p}-\frac{p}{q}$	(1)	4
e)	What must be added to $b-3a$ to give a solution of a?	(1)	$4a-b$
f)	If the sum of three consecutive integers is 93, write an equation that could be used to solve for the three numbers. (Hint: let the smallest number be x)	(1)	$x+x+1+x+2=93$ OR $3x+3=93$

g)	By using the equation from part (f), solve for the three numbers.	(1)	30, 31, 32
h)	Marcus and Sara's combined age is 30. Given that Sara is 2 years older than Marcus, find Marcus' age.	(1)	Marcus = 14 years
Geometry and Plane Shapes			
i)	Find x and y. Reasons are not required. 	(2)	$y = 98^\circ$ $x = 262^\circ$
j)	Solve for x. Reasons are not required. 	(1)	$x = 36^\circ$
k)	Name this prism and show that Euler's Rule holds by filling in the blanks. 	(2)	Name: Pentagonal Prism Faces+Vertices= 17 Edges÷2 = 17

Measurement			
l)	If a rectangular prism has a volume of $450cm^3$ and has a width of 10cm and a length of 9cm, find its height.	(1)	height = 5cm
m)	There is a 10-hour time difference between Paris and Sydney. Sandy is in Sydney and wants to call Louis in Paris. If she wants to reach Louis at 8am Paris-time, what time will Sandy need to make the call in Sydney-time?	(1)	6pm Sydney Time
n)	The following rectangle has a triangle cut out of it. What is the remaining area? 	(1)	$80cm^2$
o)	Paddy is given 60 pieces of 1m fencing. What are the dimensions of the largest area he can enclose?	(2)	$225m^2$