Students Name : _____ Maths Teachers Name _____

Sydney Technical High School

2011

YEAR 7 YEARLY

Mathematics

Examination

Time allowed: 70 minutes

THIS IS A NON CALCULATOR EXAM

- Write your name and your Maths teachers name at the top of this page
- Write your answers, in Blue or Black pen, in the space provided
- Untidy or badly arranged work may not be marked
- Marks may be awarded for working out
- Diagrams are not to scale

Number	Algebra	Directed Number	Geometry	Measurement	Total
/15	/15	/18	/20	/17	/85

Question 1 Number : 15 marks

	Answers
1. Write 17 ¼ % as a simple fraction	
2. Find 0.05 × ½	
3. If 10% of y is $2x$, What is 15% of y?	
4. What is the lowest common denominator needed for this addition? $\frac{3}{4}+\frac{1}{5}+1\frac{1}{2}+\frac{5}{12}$	
5. Simplify $\frac{1-\frac{3}{4}}{2+1\frac{1}{2}}$	
6. Find $15.06 \div (0.1 \times 0.3)$	
7. What is the cube root of $3\frac{3}{8}$?	
8. What is the reciprocal of 1.2, expressed as a simple fraction?	
9. Find $\sqrt{6^4 \times 9 \times 100}$	

10. a. Use a factor tree, or otherwise, to express 900 as a product of its prime factors.	a. 900 = _____
b. Given $35280 = 2^4 \times 3^2 \times 5 \times 7^2$ Find the LCM of 900 and 35280. Leave your answer in index form.	b. _____
c. What is $35280 \div 900$?	c. _____
11. If $4! = 1 \times 2 \times 3 \times 4$ and $5! = 1 \times 2 \times 3 \times 4 \times 5$, what is the value of $18! \div 16!$?	
12. Simplify $3\frac{1}{3} \times \frac{3}{20} - 1\frac{1}{2} \div \frac{5}{8}$	Working and answer here (2 marks)

Question 2 Algebra: 15 marks

	Answers
1. What is the value of the 9^{th} term in this sequence? -6, -11, -16, ...	
2. Does the term 72 belong to this sequence? 2, 5, 8, 11, ...	
3. Rewrite each of the following in their simplest form. a) $6 \times p \times 4 \times p \times q$ b) $24 \times a \div (3 \times a)$ c) $2m \times 8n$ d) $m \times m \times m \times n$ e) $4 + p \div 3$	a. _____ b. _____ c. _____ d. _____ e. _____
4. Answer each of the following as either TRUE (T) or FALSE (F) a) $x \div 0 = 0$ b) $m \div m^2 = m$ c) $ab \times ab = ab^2$	a. _____ b. _____ c. _____

5. Given a = 3 and b = 7, find the value of a) $7a + 2b$ b) $2a^2$	a. _____ b. _____
6. Farmer Chan is planting cactus flowers between orange trees on his property. He plants 3 flowers between each two trees in one long row. a) How many cactus flowers are needed for the 5 trees? b) How many plants in total are used if he plants 81 cactus flowers? c) How many trees are needed for *n* cactus flowers?	a. _____ b. _____ c. _____

Question 3 Directed Number: 18 marks

	Answers
1. Choose < , > or = to make each of the following statements true a) -10 ☐ $4 \times -5 \div 2$ b) -5^2 ☐ $(-4)^2$ c) $-15-(-9)$ ☐ $12 \div (-2)$	a. _____ b. _____ c. _____
2. Write down the coordinates of a) the origin b) the point 2 units above (-2, 2) c) a point lying in the 3rd quadrant of the number plane	a. _____ b. _____ c. _____
3. Given $a = -4$, $b = -6$ and $c = ½$, find the value of, a) $3a - b$ b) $2a^2$ c) $\frac{ab}{c^2}$ d) $-b^2$	a. _____ b. _____ c. _____ d. _____

4. Find the value of a) $-5-12+(-6)$ b) $(-1)^{195}$ c) $(-2)^3 \div (-4)$ d) $10-7\times -3+(2-5)$	 a. _____ b. _____ c. _____ d. _____
5. Without evaluating any of the following, decide whether the answer to each would be a positive or negative number a) $-96-109-(-200)$ b) $\frac{-96\times(-5)^2}{\sqrt[3]{-8}}$ c) $(-2)^{56}\times(1-3)^3$	 a. _____ b. _____ c. _____
6. A number squared gives an answer of 16. What could the number/s be?	

Question 4 Geometry: 20 marks

Fill in your answer on the line provided.

1. Name a quadrilateral with;

a) all sides equal _____

b) No axes of symmetry _____

c) 4 axes of symmetry _____

2. Name a solid with 5 vertices, 8 edges and 5 faces.

_____

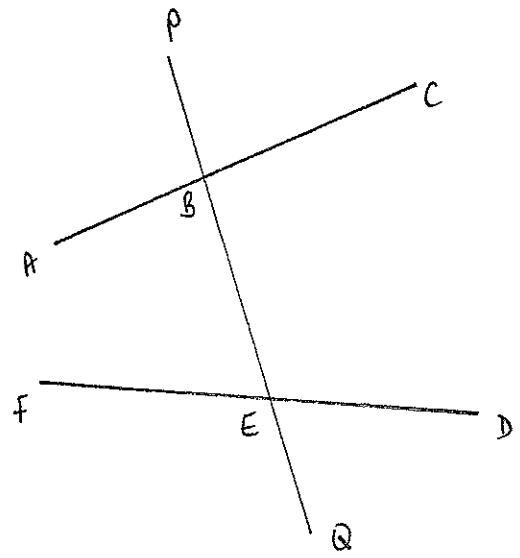
3. What is the name given to a regular 3 sided polygon?

_____

4. A quadrilateral has 2 diagonals.

How many diagonals does an octagon have? _____

5. Consider the diagram below



a) name the transversal

_____

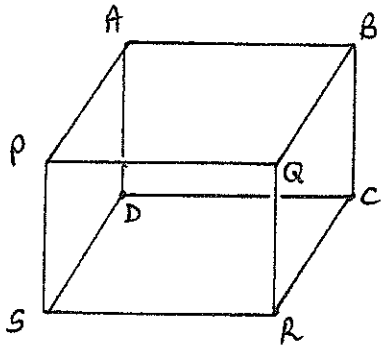
b) name the angle alternate to angle CBQ

_____

c) name the angle which is equal to angle QED

_____

6. Consider the diagram below



Name a line which is

a) Parallel to AB

_____

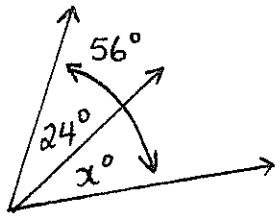
b) Perpendicular to AB

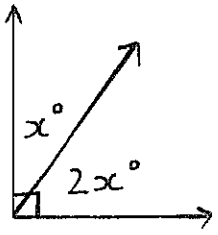
_____

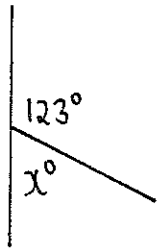
c) Skew with AB

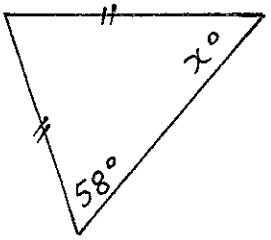
_____

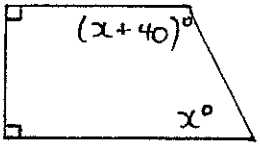
7. Find the value of each pronumeral below.

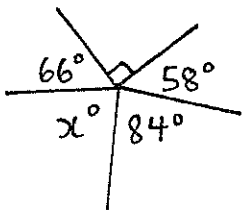


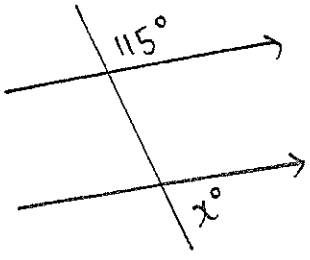


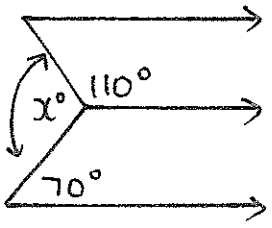












Question 5 Measurement: 17 marks

1. Convert
   a. 5.6 m into cm _____
   b. 12.84 m into mm _____
   c. ¾ km into m _____
   d. 2.25 min into seconds _____

2. Find 4 h 56 min plus 3 h 18 min (answer in hours and minutes)

   _____

   _____

3. What is the date and time 70 hours before 8 am on 29/8/2011?
   (2 marks)

   _____

   _____

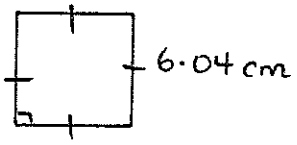
4. It takes 5 minutes to cut a log into 2 pieces. At this rate, how long should it take to cut the same log into 4 pieces?

   _____

   _____

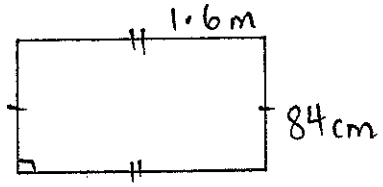
5. Find the perimeter of these shapes. Show your working (5 marks)

   a.



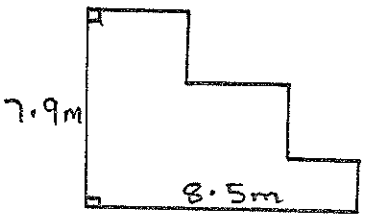
   _____

   b.



   _____

   c.



6. A rectangular pool measuring 9 m by 2.2 m is to be surrounded by a fence. The fence is to be 150 cm from the edge of the pool and comes in 40 cm sections, each costing $15.

   a. What is the length of fencing required?

   b. What is the cost of fencing the pool?

(4 marks)

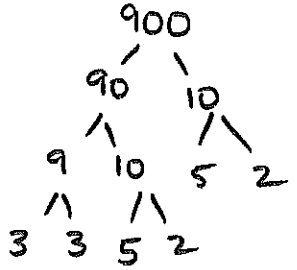
THE END

Make sure that your Name and Your Maths Teacher's name is on the FRONT of the examination.

ANSWERS

Question 1 Number : 15 marks

	Answers
1. Write 17 ¼ % as a simple fraction	$\frac{69}{400}$
2. Find $0.05 \times ½$	0.025 or $\frac{1}{40}$
3. If 10% of y is $2x$, What is 15% of y?	$3x$
4. What is the lowest common denominator needed for this addition? $\frac{3}{4}+\frac{1}{5}+1\frac{1}{2}+\frac{5}{12}$	60
5. Simplify $\frac{1-\frac{3}{4}}{2+1\frac{1}{2}}$	$\frac{1}{14}$
6. Find $15.06 \div (0.1 \times 0.3)$	502
7. What is the cube root of $3\frac{3}{8}$?	$1\frac{1}{2}$
8. What is the reciprocal of 1.2, expressed as a simple fraction?	$\frac{5}{6}$
9. Find $\sqrt{6^4 \times 9 \times 100}$	1080

10. a. Use a factor tree, or otherwise, to express 900 as a product of its prime factors.  b. Given $35280 = 2^4 \times 3^2 \times 5 \times 7^2$ Find the LCM of 900 and 35280. Leave your answer in index form. c. What is $35280 \div 900$? $\frac{2^4 \times 3^2 \times 5 \times 7^2}{2^2 \times 3^2 \times 5^2}$	a. $900 = 2^2 \times 3^2 \times 5^2$ b. $2^4 \times 3^2 \times 5^2 \times 7^2$ c. $\frac{2 \times 7^2}{5} = \frac{98}{5}$
11. If $4! = 1 \times 2 \times 3 \times 4$ and $5! = 1 \times 2 \times 3 \times 4 \times 5$, what is the value of $18! \div 16!$?	$18 \times 17 = 306$
12. Simplify $3\frac{1}{3} \times \frac{3}{20} - 1\frac{1}{2} \div \frac{5}{8}$	Working and answer here (2 marks) $= \frac{10}{3} \times \frac{3}{20} - \frac{3}{2} \times \frac{8}{5}$ $= \frac{1}{2} - 2\frac{2}{5}$ $= \frac{5}{10} - 2\frac{4}{10}$ $= -1\frac{9}{10}$

Question 2 Algebra: 15 marks

	Answers
1. What is the value of the 9th term in this sequence? -6, -11, -16, ...	-46
2. Does the term 72 belong to this sequence? 2, 5, 8, 11, ...	No
3. Rewrite each of the following in their simplest form. a) $6 \times p \times 4 \times p \times q$ b) $24 \times a \div (3 \times a)$ c) $2m \times 8n$ d) $m \times m \times m \times n$ e) $4 + p \div 3$	a. $24p^2q$ b. 8 c. $16mn$ d. m^3n e. $4 + \frac{p}{3}$
4. Answer each of the following as either TRUE (T) or FALSE (F) a) $x \div 0 = 0$ b) $m \div m^2 = m$ c) $ab \times ab = ab^2$	a. F b. F c. F

5. Given a = 3 and b = 7, find the value of a) $7a + 2b$ b) $2a^2$	a. 35 b. 18
6. Farmer Chan is planting cactus flowers between orange trees on his property. He plants 3 flowers between each two trees in one long row. a) How many cactus flowers are needed for the 5 trees? b) How many plants in total are used if he plants 81 cactus flowers? c) How many trees are needed for n cactus flowers?	a. 12 b. 109 c. $\frac{n}{3} + 1$

Question 3 Directed Number: 18 marks

	Answers
1. Choose $<$, $>$ or $=$ to make each of the following statements true a) $-10 \square 4 \times -5 \div 2$ b) $-5^2 \square (-4)^2$ c) $-15-(-9) \square 12 \div (-2)$	a. $=$ b. $<$ c. $=$
2. Write down the coordinates of a) the origin b) the point 2 units above (-2, 2) c) a point lying in the 3rd quadrant of the number plane	a. $(0,0)$ b. $(-2,4)$ c. $(-x,+y)$ in this form.
3. Given $a = -4$, $b = -6$ and $c = \frac{1}{2}$, find the value of, a) $3a-b$ b) $2a^2$ c) $\frac{ab}{c^2}$ d) $-b^2$	a. -6 b. 32 c. 96 d. -36

4. Find the value of a) $-5-12+(-6)$ b) $(-1)^{195}$ c) $(-2)^3 \div (-4)$ d) $10-7\times-3+(2-5)$	a. -23 b. -1 c. 2 d. 28
5. Without evaluating any of the following, decide whether the answer to each would be a positive or negative number a) $-96-109-(-200)$ b) $\frac{-96\times(-5)^2}{\sqrt[3]{-8}}$ c) $(-2)^{56}\times(1-3)^3$	a. Neg b. Pos c. Neg
6. A number squared gives an answer of 16. What could the number/s be?	± 4

Question 4 Geometry: 20 marks

Fill in your answer on the line provided.

1. Name a quadrilateral with;

a) all sides equal rhombus or square

b) No axes of symmetry parallelogram

c) 4 axes of symmetry square

2. Name a solid with 5 vertices, 8 edges and 5 faces.

square or rectangular pyramid

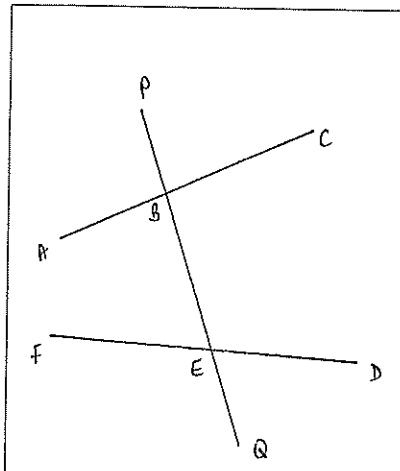
3. What is the name given to a regular 3 sided polygon?

equilateral triangle

4. A quadrilateral has 2 diagonals.

How many diagonals does an octagon have? 20

5. Consider the diagram below



a) name the transversal

PQ

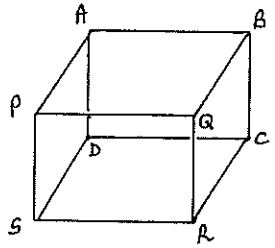
b) name the angle alternate to angle CBQ

∠FEP

c) name the angle which is equal to angle QED

∠BEF

6. Consider the diagram below



Name a line which is

a) Parallel to AB

DC PQ SR (one of)

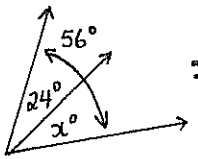
b) Perpendicular to AB

AD or BC

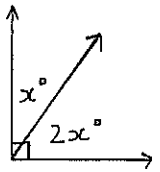
c) Skew with AB

PS or QR or RC or DS

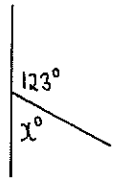
7. Find the value of each pronumeral below.



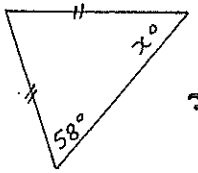
$x = 32$



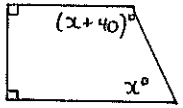
$x = 30$



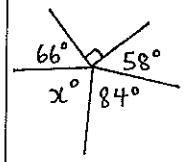
$x = 57$



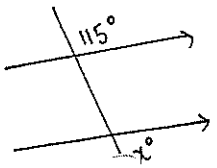
$x = 58$



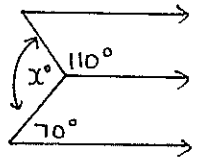
$x = 70$



$x = 62$



$x = 65$



$x = 140$

Question 5 Measurement: 17 marks

1. Convert
   a. 5.6 m into cm — 560 cm
   b. 12.84 m into mm — 12840 mm
   c. ¾ km into m — 750 m
   d. 2.25 min into seconds — 135 s

2. Find 4 h 56 min plus 3 h 18 min (answer in hours and minutes)

   8 h 14 min

3. What is the date and time 70 hours before 8 am on 29/8/2011? (2 marks)

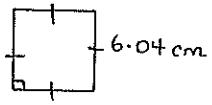
   10 am (1) 26/8/2011 (1)

4. It takes 5 minutes to cut a log into 2 pieces. At this rate, how long should it take to cut the same log into 4 pieces?

   15 min

5. Find the perimeter of these shapes. Show your working (5 marks)

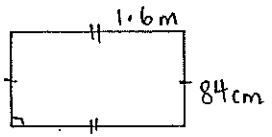
   a.

   $P = 4 \times 6 \cdot 04$

   $= 24 \cdot 16$ cm (1)

   b.

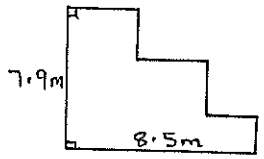
   $P = 2 \times 1 \cdot 6 + 2 \times 0 \cdot 84$ (2)

   $= 4 \cdot 88$ m

   488 cm

   must have units for both marks!

   c.

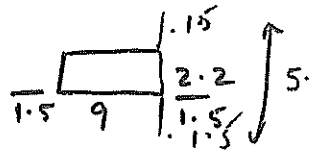
   

   $P = 2 \times 7 \cdot 9 + 2 \times 8 \cdot 5$

   $= 32 \cdot 8$ m (2)

6. A rectangular pool measuring 9 m by 2.2 m is to be surrounded by a fence. The fence is to be 150 cm from the edge of the pool and comes in 40 cm sections, each costing $15.

   a. What is the length of fencing required?

   Length = 12 + 12 + 5·2 + 5·2 — (1)

   = 34·4 m — (1)

   b. What is the cost of fencing the pool?

   length = 12m = 30 sections
   breadth = 520cm = 13 sections } (1)

   cost = 86 x $15

   = $1290 — (1)

   (4 marks)

THE END

Make sure that your Name and Your Maths Teacher's name is on the FRONT of the examination.