SYDNEY TECHNICAL HIGH SCHOOL

MATHEMATICS

YEAR 8 COMMON TEST

MAY 2010

Name:_____ **Teacher:**_____

Time Allowed: **70 minutes.**

Instructions:

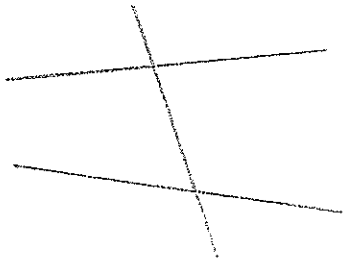
- The non-calculator section will be collected after 15 minutes.
- Calculators may be used in the remainder of the test.
- Show necessary working in the spaces provided or full marks may not be given.
- Questions are worth one mark each unless otherwise indicated.

Non-Calc.	Geometry	Algebra I	Algebra II	Pythagoras	Percentages
/20	/13	/15	/12	/14	/14

Total **/88**

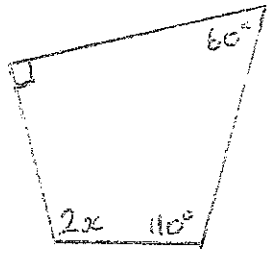
Geometry

a) On the diagram, mark a pair of corresponding angles



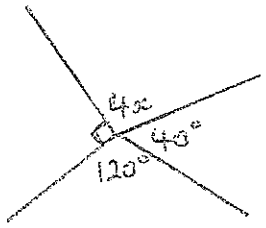
b) Find the value of x in degrees (no reasons needed):

i)



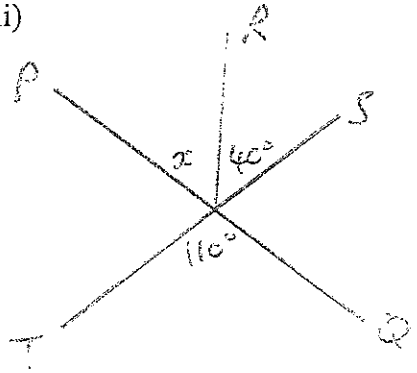
_____

ii)



_____

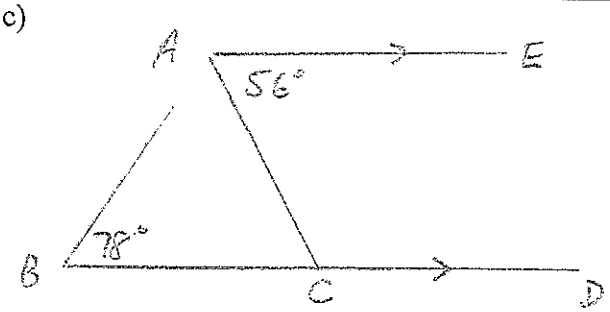
iii)



_____

PQ and ST are straight lines

c)



Complete the following. Give reasons without abbreviation.

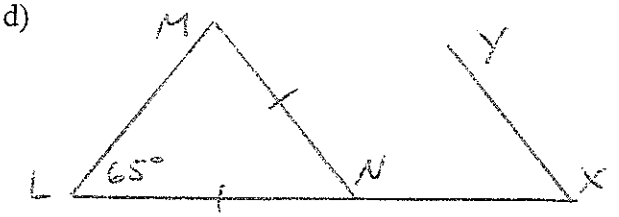
i)$\angle ACB =$ _____

(.....)

ii)$\angle EAB =$ _____

(.....)

d)



Complete the following. Give reasons without abbreviation.

i) $\angle M =$ _____

(.....)

ii) $\angle MNX =$ _____

(.....)

iii) If $\angle X = 48°$, is MN parallel to YX? Give a reason.

_____

_____

Algebra II

a) If $x = -3,\ y = 4$ evaluate:

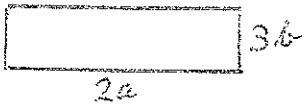
i) $x + 2y$ _____

_____

ii) yx^2 _____

_____

b)



For this rectangle write a simple expression for the:

i) perimeter _____

_____

ii) area _____

_____

c) Fully simplify each expression:

i) $x + x$ _____

ii) $x \times x \times 4 \times y \times x$ _____

iii) $4x + 4y - x + y$ _____

iv) $5x^2y^3 \times 3xy^2$ _____

v) $36m^2 \div 9$ _____

vi) x^0 _____

vii) $(2a^2)^3$ _____

viii) $\sqrt{x^{10}}$ _____

ix) $20x^2 \div 5x^2$ _____

x) $\dfrac{10x^2y}{25xy^3}$ _____

xi) $(9m^2)^0 \times (9m^0)^2$ _____

Algebra II

a) If $f(x) = 5x - 3$, $g(x) = x(1 - x)$

evaluate:

i) $f(4)$ _____

ii) $f(0) + g(2)$ _____

_____

b) Expand:

i) $4(2x + 3)$ _____

ii) $-(m^2 - 4m)$ _____

iii) $x^2(x^3 + 4x - 2y)$

_____

c) Expand and simplify:

$5x(x - 3) - 2(x - x^2)$

_____

_____

(2 marks)

d) Fully factorise:

i) $3x + 6$ _____

ii) $x^2y + xy^3$ _____

iii) $-9ab - 12a$ _____

e) Simplify $(3a)^2 \times (2ab^2)^3 \div 36a^6b^2$

_____

_____

_____

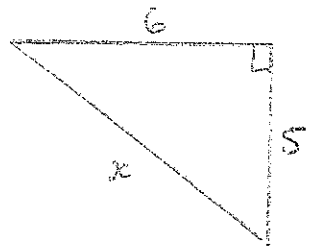
_____

(2 marks)

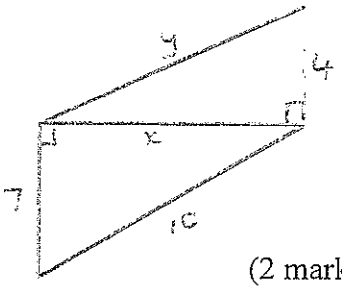
Pythagoras

a) Find the value of each pronumeral. Leave your answer in exact form.

i)

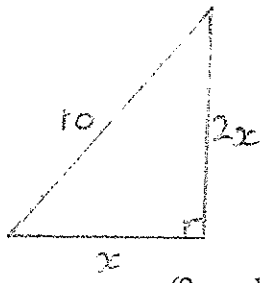


ii)



(2 marks)

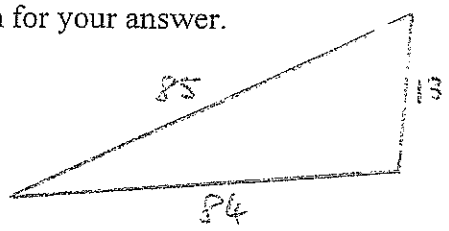
iii)



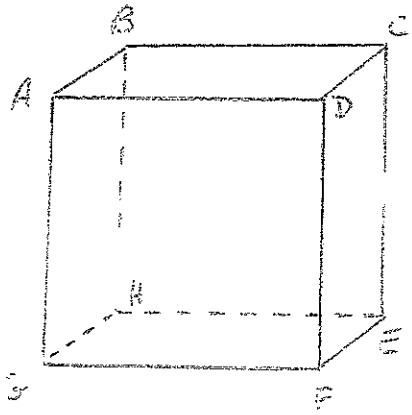
(2 marks)

b) Decide whether or not the triangle shown is right-angled.

Give a reason for your answer.



c)



The cube has a side length of 12cm.

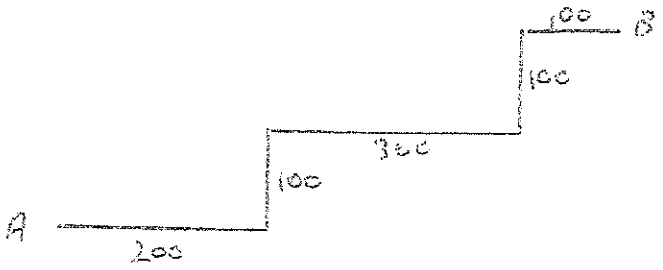
a) Find GE in exact form.

b) Find AE in exact form.

d) Find the direct distance AB.

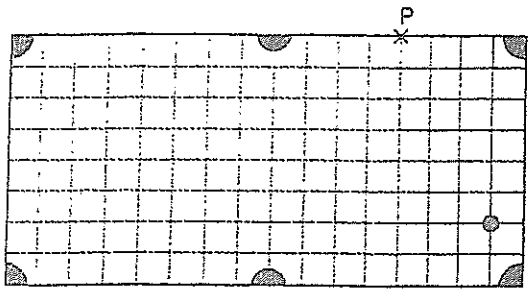
Give your answer correct to

1 decimal place.



e) There are two right-angled triangles with sides 5cm and 12cm. Find both possible lengths for the third side. (2 marks)

f) The diagram shows a snooker table. It measures 4m by 2m, so that each unit on the square grid represents 0.25m.



A person hits the ball (marked by the dot) firmly towards point P, where it bounces symmetrically off the cushion. It continues in this way until it reaches one of the six holes.

i) Draw the total path of the ball on the diagram.

ii) Calculate the total distance (in metres) travelled by the ball, correct to 1 decimal place. (2 marks)

Percentages

a) Express as simple fractions:

i) 80% _____

ii) $7\frac{1}{2}\%$ _____

b) Express 3 hours as a percentage of a whole day. _____

_____

c) Find 42% of \$15.50

_____

d) Increase \$54 by 20% and decrease the result by 20%. _____

_____

e) If 36% of M is \$9, find the whole of M.

_____

_____

f) A can of soft drink is bought by the shop for \$1 and re-sold to a customer for \$2.50.

Calculate the profit as a percentage of the:

i) cost price. _____

_____

ii) selling price. _____

_____

g) Find the simple interest earned when \$5000 is invested for $3\frac{1}{2}$ years at 9% p.a.

_____

_____

h) Find the annual rate of simple interest if \$8000 earns \$150 interest in 4 months.

_____

_____

_____

i) A salesman earns a base wage of \$500 per week. Additionally, he also earns 2.5% of the value of all his sales.

i) Find his total wage in a week when he has sales of \$12000.

_____

_____

ii) If he earns \$900 in a week, what is the value of his sales? (2 marks)

_____

_____

_____

_____

_____

Turn over for last question

j) A car sold for $10000 and this was 30% less than its advertised price. Find the advertised price to the nearest dollar.

Non Calculator (Name: _____) **Answers Only**

a) Express: i) $\frac{3}{20}$ as a percentage. ii) $2\frac{1}{2}\%$ as a decimal.	i) ii)
b) Between which two whole numbers does $\sqrt{200}$ lie?	
c) If $3.25 \times 0.94 = 3.055$, what is the value of 0.325×940?	
d) $0.3 \times 0.12 = ?$	
e) Write the simple fraction that is halfway between $\frac{1}{3}$ and $\frac{1}{5}$	
f) Two numbers have an average of 6. If one of them is -3, what is the other?	
g) $3.54 - 8 = ?$	
h) $0.8 \div 0.1 = ?$	
i) Find the value of m that makes $2m + 3 = -10$ true.	
j) Find the value of $4x^2 + 2x$ when $x = -1$	
k) Write the rule for this table. x | 1 | 2 | 3 | 4 y | 9 | 8 | 7 | 6	y =
l) Find 15% of \$268.	

m) True or false: 123% of \$469 = 469% of \$123.	
n) Write a simplified expression for the perimeter of a rectangle $(x + 2)$cm long and $(x + 1)$cm wide.	
o) What are the coordinates of the point on the number plane that is 2 units to the right and 1 unit down from (3,4)?	
p) $\frac{10}{\frac{1}{5}} = ?$	
q) Arrange from smallest to largest: $\frac{1}{3}$, $\sqrt{\frac{1}{3}}$, 0.3	
r) Insert grouping symbols to make the following true: $10 - 4 \times 2 - 8 + 4 = 0$	
s) Draw the shape when it is rotated 180° about A. Use a ruler.