Name:_____ Teacher:_____

SYDNEY TECHNICAL HIGH SCHOOL

YEAR 7 MATHEMATICS COMMON TEST

MAY 2011

Time allowed: 70 minutes

Instructions:

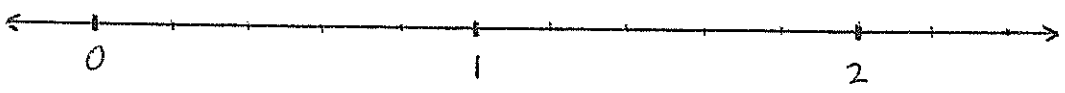
1. Attempt all questions.
2. NO calculators may be used.
3. Show any necessary working in the spaces provided.
4. All questions are worth 1 mark unless indicated otherwise.

Question	Topic	Total	Marks
1	Number System	23	
2	Number Theory	20	
3	Fractions	12	
4	Decimals and %	15	
5	Problem Solving	10	
		80	

Question 1 – The Number System

Answers Only

a)	Evaluate: i) $64 + 46$ ii) $100-37$ iii) 75×4 iv) $\sqrt{9+16}$ v) $\sqrt[3]{27}$	 i) ii) iii) iv) v)
b)	Write the numeral for "eighty five thousand and sixteen"	
c)	Write the numeral for $3\times10^4+7\times10^3+6\times10^2+5$	
d)	Write 2500 in the same expanded form as c) above.	
e)	Evaluate i) $20000\div40$ ii) $637\div6$	i) ii)
f)	Add the product of 5 and 4 to the quotient of 10 and 2	
g)	The average of four scores is 15. If a new score of 20 is added, what is the new average?	
h)	Write the next number in these patterns i) 3,4,7,11,18,..... ii) 360,250,160,90.....	 i) ii)
i)	Evaluate i) $10+10\div2$ ii) $20-[8-(6-2)]$ iii) $\frac{100}{2\times5^2}$	i) ii) iii)

j)	Write i) 1729 in Roman numerals ii) DCLXV in our numerals	i) ii)
k)	"ten million" can be written as 10^7. Write "a hundred million" in the same way.	
l)	Insert grouping symbols to make this statement true: $10 - 4 + 1 \times 2 = 0$	
m)	Mark and label the positions for $\frac{4}{10}$ and 1.3 on this number line. (2 marks)  	

Question 2 - Number Theory

Answers Only

a)	Use symbols to write this statement exactly: " Four squared is greater than fifteen"	
b)	If $\square$ and $\triangle$ represent counting numbers, write **True** or **False** for each below: i) $\sqrt{\square + \triangle} = \sqrt{\square} + \sqrt{\triangle}$ ii) $\frac{\text{zero}}{\square} = \text{zero}$ iii) $\frac{\square \times \triangle}{2} = \frac{\square}{2} \times \frac{\triangle}{2}$ iv) $\frac{1}{\square + \triangle} \neq \frac{1}{\square} + \frac{1}{\triangle}$	i) ii) iii) iv)
c)	Insert the correct number into the box: $37 \times 45 + 3 \times 45 = \square \times 45$	
d)	23432 is a palindromic number. Write down the next palindromic number above 23432.	

e)	Write the first five: i) even numbers ii) square numbers iii) triangular numbers iv) Fibonacci numbers v) prime numbers	i) ii) iii) iv) v)
f)	Write the first: i) square number that is larger than 900 ii) prime number that is larger than 50 iii) number larger than 1000 that is a multiple of both 3 and 4	i) ii) iii)
g)	Write the highest common factor of 15 and 60	
h)	Write the lowest common multiple of 4, 5 and 6	
i)	Write the highest common factor of $(2 \times 5 \times 5 \times 7 \times 7 \times 13)$ *and* $(2 \times 2 \times 5 \times 5 \times 7 \times 11)$	
j)	Use a factor tree to express 300 as a product of primes. (2 marks)	

Question 3 – Fractions

Answers Only

a)	Simplify $\frac{10}{15}$	
b)	Find $\frac{3}{7}$ of 42	
c)	Express i) $\frac{7}{25}$ as a percentage ii) $\frac{1}{8}$ as a decimal	i) ii)
d)	Find i) $\frac{1}{2} \times \frac{1}{3}$ ii) $\frac{1}{2} \div \frac{1}{3}$	i) ii)
e)	Three friends shared a pizza. One had $\frac{3}{8}$ of the pizza and another had $\frac{2}{5}$ of the pizza. What fraction did the third person have?	
f)	If $\frac{4}{5}$ of a water tank holds 1000 litres, what is the full capacity of the tank?	
g)	Evaluate $13\frac{1}{2} - 7\frac{5}{8}$	
h)	Evaluate $\left(3\frac{1}{2} \times 1\frac{1}{2}\right) + (2 \div 1\frac{1}{3})$	(show working- 3 marks)

Question 4 – Decimals and Percentages

Answers Only

a) Evaluate:	i) $0.7 + 0.3$	i)
	ii) $0.9 - 0.09$	ii)
	iii) 0.3×0.2	iii)
	iv) 5.26×1000	iv)
	v) $0.4 \div 8$	v)
	vi) $3.6 \div 0.09$	vi)
b)	Write 165% as a decimal	
c)	If $5.65 \times 13.95 = 78.8175$, what is the value of 0.565×1.395?	
d)	Round off 6.4849 to 2 decimal places.	
e)	A small cup holds 0.08 litres. If one drop of water is 0.001 litres, how many drops will fill the cup?	
f)	John bought 35 litres of fuel at 98.5 cents per litre. Find the total cost in dollars and cents, to the nearest cent. (Show working-2 marks) Answer _____	
g)	Find 70% of \$200	
h)	Express 28 kg as a percentage of 50 kg.	
i)	If 30% of the whole amount is \$36, find the whole amount.	

Question 5 - Problem Solving

a) The cost of a bottle and cork is $1.00. If the bottle costs 95 cents more than the cork, what is the cost of the cork?

Answer _____

b) $3502 is shared equally among 17 people. How much does each receive?
(Show working- 2 marks)

Answer_____

c) A blind person enters an elevator at an unknown floor. He went up 4 floors, then down 9 floors, then up 1 floor and finally 12 floors down to the ground floor. At what floor did the person enter the elevator?

Answer _____

d) For the last 8 years, a town's population has increased at an average rate of 1296 citizens per year.
If the town's present population is 80842, what was its population 8 years ago? (Show working- 2 marks)

Answer_____

e) There is a shortcut for adding numbers called "pairing", e.g. 1+9, 2+8, etc.
Use this shortcut to find the sum of all the counting numbers from 1 to 100 (inclusive).
(Show working- 2 marks)

Answer_____

f) A small spider crawls up a window. It takes her 1 minute to crawl 5cm upwards. She then rests for 1 minute but slides back 2 cm during this time.

How high will she be after 25 minutes? (2 marks)

Answer _____

END OF TEST

Name:_____ Teacher:_____

SYDNEY TECHNICAL HIGH SCHOOL

YEAR 7 MATHEMATICS COMMON TEST

MAY 2011

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ANSWERS

Instructions:

1. Attempt all questions.
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1	Number System	23	
2	Number Theory	20	
3	Fractions	12	
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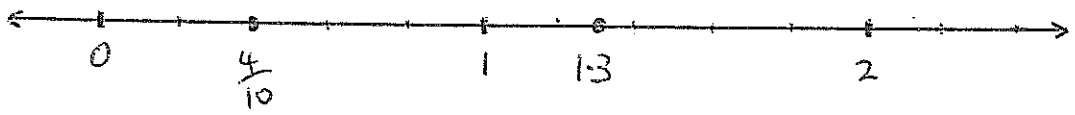
5	Problem Solving	10	
		80	

Question 1 – The Number System

Answers Only

a)	Evaluate: i) $64 + 46$ ii) $100-37$ iii) 75×4 iv) $\sqrt{9+16}$ v) $\sqrt[3]{27}$	i) 110 ii) 63 iii) 300 iv) 5 v) 3
b)	Write the numeral for "eighty five thousand and sixteen"	85016
c)	Write the numeral for $3\times10^4+7\times10^3+6\times10^2+5$	37605
d)	Write 2500 in the same expanded form as c) above.	$2\times10^3+5\times10^2$
e)	Evaluate i) $20000\div40$ ii) $637\div6$	i) 500 ii) $106\frac{1}{6}$
f)	Add the product of 5 and 4 to the quotient of 10 and 2	25
g)	The average of four scores is 15. If a new score of 20 is added, what is the new average?	16
h)	Write the next number in these patterns i) 3,4,7,11,18,..... ii) 360,250,160,90.....	i) 29 ii) 40
i)	Evaluate i) $10+10\div2$ ii) $20-[8-(6-2)]$ iii) $\frac{100}{2\times5^2}$	i) 15 ii) 16 iii) 2

j)	Write i) 1729 in Roman numerals ii) DCLXV in our numerals	i) MDCCXXIX ii) 665
k)	"ten million" can be written as 10^7. Write "a hundred million" in the same way.	10^8
l)	Insert grouping symbols to make this statement true: $10 - (4 + 1) \times 2 = 0$	
m)	Mark and label the positions for $\frac{4}{10}$ and 1.3 on this number line. (2 marks)  	

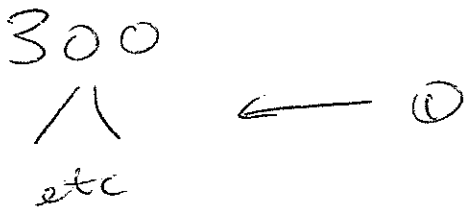
Question 2 - Number Theory

Answers Only

a)	Use symbols to write this statement exactly: " Four squared is greater than fifteen"	$4^2 > 15$
b)	If $\square$ and $\triangle$ represent counting numbers, write **True** or **False** for each below: i) $\sqrt{\square + \triangle} = \sqrt{\square} + \sqrt{\triangle}$ ii) $\frac{\text{zero}}{\square} = \text{zero}$ iii) $\frac{\square \times \triangle}{2} = \frac{\square}{2} \times \frac{\triangle}{2}$ iv) $\frac{1}{\square + \triangle} \neq \frac{1}{\square} + \frac{1}{\triangle}$	i) F ii) T iii) F iv) T
c)	Insert the correct number into the box: $37 \times 45 + 3 \times 45 = \boxed{40} \times 45$	
d)	23432 is a palindromic number. Write down the next palindromic number above 23432.	23532

e)	Write the first five: i) even numbers ii) square numbers iii) triangular numbers iv) Fibonacci numbers v) prime numbers each must be all correct to get the 1 mark (5 marks total here)	i) 2, 4, 6, 8, 10 ii) 1, 4, 9, 16, 25 iii) 1, 3, 6, 10, 15 iv) 1, 1, 2, 3, 5 v) 2, 3, 5, 7, 11
f)	Write the first: i) square number that is larger than 900 ii) prime number that is larger than 50 iii) number larger than 1000 that is a multiple of both 3 and 4	i) 961 ii) 53 iii) 1008
g)	Write the highest common factor of 15 and 60	15
h)	Write the lowest common multiple of 4, 5 and 6	60
i)	Write the highest common factor of $(2 \times 5 \times 5 \times 7 \times 7 \times 13)$ *and* $(2 \times 2 \times 5 \times 5 \times 7 \times 11)$	$2 \times 5 \times 5 \times 7$ or 350

j) Use a factor tree to express 300 as a product of primes. (2 marks)



$2 \times 2 \times 3 \times 5 \times 5$ ← (1)

Question 3 – Fractions

Answers Only

a)	Simplify $\frac{10}{15}$	$\frac{2}{3}$
b)	Find $\frac{3}{7}$ of 42	18
c)	Express i) $\frac{7}{25}$ as a percentage ii) $\frac{1}{8}$ as a decimal	i) 28% ii) 0·125
d)	Find i) $\frac{1}{2} \times \frac{1}{3}$ ii) $\frac{1}{2} \div \frac{1}{3}$	i) $\frac{1}{6}$ ii) $1\frac{1}{2}$
e)	Three friends shared a pizza. One had $\frac{3}{8}$ of the pizza and another had $\frac{2}{5}$ of the pizza. What fraction did the third person have?	$\frac{9}{40}$
f)	If $\frac{4}{5}$ of a water tank holds 1000 litres, what is the full capacity of the tank?	1250 L
g)	Evaluate $13\frac{1}{2} - 7\frac{5}{8}$	$5\frac{7}{8}$

h) Evaluate $\left(3\frac{1}{2} \times 1\frac{1}{2}\right) + \left(2 \div 1\frac{1}{3}\right)$ (show working- 3 marks)

$= \frac{7}{2} \times \frac{3}{2} + 2 \div \frac{4}{3}$

$= \frac{21}{4} + 2 \times \frac{3}{4}$ ← ①

$= \frac{21}{4} + \frac{6}{4}$ ← ①

$= \frac{27}{4}$

$= 6\frac{3}{4}$ ← ①

Question 4 – Decimals and Percentages

Answers Only

a) Evaluate:	i) $0.7 + 0.3$	i) 1
	ii) $0.9 - 0.09$	ii) 0.81
	iii) 0.3×0.2	iii) 0.06
	iv) 5.26×1000	iv) 5260
	v) $0.4 \div 8$	v) 0.05
	vi) $3.6 \div 0.09$	vi) 40
b)	Write 165% as a decimal	1.65
c)	If $5.65 \times 13.95 = 78.8175$, what is the value of 0.565×1.395?	0.788175
d)	Round off 6.4849 to 2 decimal places.	6.48
e)	A small cup holds 0.08 litres. If one drop of water is 0.001 litres, how many drops will fill the cup?	80
f)	John bought 35 litres of fuel at 98.5 cents per litre. Find the total cost in dollars and cents, to the nearest cent. (Show working-2 marks) 985 × 35 34475 ← 1 mark	1 mark ↓ Answer $34.48
g)	Find 70% of $200	$140
h)	Express 28 kg as a percentage of 50 kg.	56%
i)	If 30% of the whole amount is $36, find the whole amount.	$120

Question 5 - Problem Solving

a) The cost of a bottle and cork is $1.00. If the bottle costs 95 cents more than the cork, what is the cost of the cork?

1 mark

Answer 2½ cents

b) $3502 is shared equally among 17 people. How much does each receive?

(Show working - 2 marks)

$$17\overline{)3502} = 206$$

Answer $206

c) A blind person enters an elevator at an unknown floor. He went up 4 floors, then down 9 floors, then up 1 floor and finally 12 floors down to the ground floor. At what floor did the person enter the elevator?

1 mark

Answer 16th floor

d) For the last 8 years, a town's population has increased at an average rate of 1296 citizens per year.

If the town's present population is 80842, what was its population 8 years ago? (Show working - 2 marks)

$1296 \times 8 = 10368$ (1)

$80842 - 10368 = 70,474$ (1)

Answer 70474

e) There is a shortcut for adding numbers called "pairing", e.g. 1+9, 2+8, etc.

Use this shortcut to find the sum of all the counting numbers from 1 to 100 (inclusive).

(Show working - 2 marks)

1 for some method shown

Answer 5050

f) A small spider crawls up a window. It takes her 1 minute to crawl 5cm upwards. She then rests for 1 minute but slides back 2 cm during this time.

How high will she be after 25 minutes? (2 marks)

$(12 \times 5) - (12 \times 2) + 5 = 41$ cm

① for some understandable method.

Answer 41 cm.

END OF TEST