Name_____ Teacher_____

YEAR 7

SYDNEY TECHNICAL HIGH SCHOOL

MATHEMATICS
COMMON TEST
MAY 2013

Instuctions

1. Time Allowed 65 minutes
2. Blue or black pen must be used
3. All necessary working must be shown in spaces provided
4. Calculators must NOT be used
5. Setting out for problems must be clear and marks will be deducted if it is not

MARKS		
Question 1		/15
Question 2		/15
Question 3		/15
Question 4		/15
Question 5		/10
Total		/70

Name_____ Teacher_____

QUESTION 1 (15 marks) Answers in spaces provided

a) Find the value of Δ to make the number sentence true

i) $5 \times (\Delta + 6) = 45$ Δ=_____ 1

ii) $\Delta \times \Delta \times \Delta = 8$ Δ=_____ 1

iii) $\sqrt{\Delta} = 13$ Δ=_____ 1

b) Simplify $(28 - 7) \times 4 - 2$ =_____ 1

c) Simplify $20 + 6 \times 5 - 50$ =_____ 1

d) If Δ is replaced by 8 evaluate $5 \times (19 - \Delta) \div 11$ =_____ 1

e) Write MMCMLXXIV using Hindu-Arabic numerals_____ 1

f) Write the basic numeral for

$5 \times 10^6 + 3 \times 10^4 + 2 \times 10$ =_____ 1

g) Write 1979 in Roman Numerals_____ 1

h) Simplify $18 \div [24 - 6 \times 3]$ =_____ 1

i) Insert grouping symbols to make the expression below true 1

$12 - 4 - 3 = 11$

Name_____ Teacher_____

j) Fill in the empty boxes to complete this magic square 2

Note: In a magic square all vertical, horizontal and diagonal lines have the same total

	7	
8	3	10

k) If 15 metres of material costs $27, what is the cost of 10 metres of 2

the same material?

_____

_____

QUESTION 2 (15 marks) Answers in spaces provided

a) True or False? 1

$15 + 5 \times 2 - 6 = 19$_____

b) Find $\sqrt{\frac{1}{4}}$ _____ 1

c) Find $\sqrt[3]{125}$ _____ 1

d) Find the cube of 4 _____ 1

e) Write all the prime numbers between 10 and 20

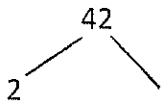
_____ 1

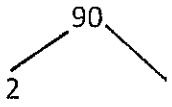
f) " A number that is not prime is called a _____ number" 1

Write the missing word in the space provided.

Name_____ Teacher_____

g) Complete the factor trees below to write 42 and 90 as a product of their prime factors.





42=_____ 90=_____ 2

h) Using your answers to part g) above write the 2

H.C.F. (highest common factor) of 42 and 90 in factored form

_____

L.C.M. (lowest common multiple) of 42 and 90 in factored form

_____

i) Find $\sqrt{3^6 \times 7^2}$_____ 1

j) i) Write 441 as a product of its prime factors (hint: use a factor tree) 1

ii) Use your answer to part i) above to find $\sqrt{441}$ _____ 1

k) Find $(-2^3) \times -5 =$_____ 1

l) Find $10 + -4 - -5 - 8 =$ _____ 1

Name_____ Teacher_____

QUESTION 3 (15 marks) Working in spaces provided

a) 67 × 2

84

.....

b) 9833 - 2

4097

.....

c) $6\overline{)1157}$ (express remainder as a fraction) 2

d) $4.40 + $97.35 + 74 cents 2

e) $51.92 ÷ 8 2

f) Complete the pattern by filling in the boxes 2

3 , 4 → 24

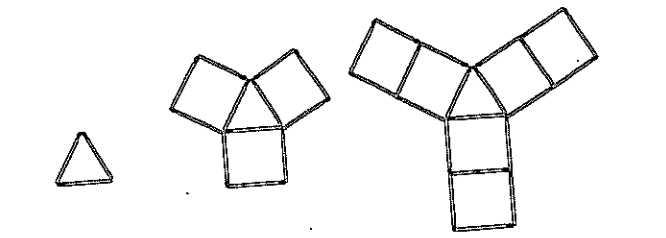
7 , 2 →28

6 , 6 → ☐

3 , 9 → ☐

Name_____ Teacher_____

g) This match pattern shows SQUARES that grow outwards from an EQUILATERAL TRIANGLE at the centre. Extra matches are added in each shape. 3

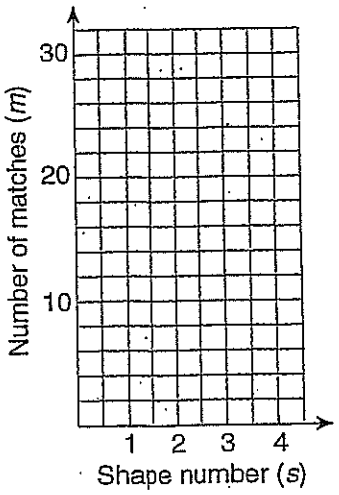


Shape 1 Shape 2 Shape 3

i) Complete the table below to show the pattern where s stands for the shape and m stands for number of matches used in each shape.

s	1	2	3	4
m				

ii) Use the values in the table to plot the points from the above table on the number plane below



Question 4 (15 marks) SHOW ALL WORKING IN SPACE PROVIDED

a) Find $26\overline{)963}$ (leave the remainder as a fraction) 2

Name_____ Teacher_____

b) From the sum of 94 and 48 subtract 76 2

c) For a school excursion, 127 students need to travel by bus. If the bus can only seat 48 students , how many buses are required? (explain your answer) 2

d) The circumference of a bicycle wheel is $2\frac{1}{2}$ metres. How far does the cyclist travel in 1000 turns of the wheel? (answer in km) 2

e) A petrol station sold 330,000 litres of petrol during September. What was the average number of litres sold per day during that month? 2

f) i) Write the next 2 lines of the pattern below 1

$$1 = 1 = 1^2$$

$$1 + 3 = 4 = 2^2$$

$$1 + 3 + 5 = 9 = 3^2$$

ii) Use this pattern to find the sum of the first 10 odd numbers. 1

iii) How many odd numbers when added in order will give a sum of 361? 1

Name_____ Teacher_____

g) The temperature in Canberra at midnight one day in June is –3°C. The temperature in Mildura is 4°C. How much warmer is it in Mildura than in Canberra? _____ 1

h) Rose's bank account was overdrawn. She paid in $100. This made the balance $41 exactly. By how much had the account been overdrawn? 1

_____

QUESTION 5 (10 marks) SHOW WORKING IN SPACE PROVIDED

(2 marks each)

a) Increase 679 by the product of 72 and 9

_____

_____

_____

b) I plan to buy an item with the cash price of $105. I have saved $25 already and plan to save $7 a month for the next 12 months. Will I have enough to buy the item? (explain your answer)

_____

_____

_____

c) Each time a girl makes a phone call to her friend, her father charges her 20c. This amount is subtracted from her allowance of $8 a week. How many calls can she afford to make in one week before her allowance would fall to $4.

_____

_____

_____

_____

Name_____ Teacher_____

d) John purchased a table for $132 and a radio for $86. After sending $26.50 on repairs, he sold the two items to a customer for $349.95. How much profit did he make altogether on the 2 items.

e) If I scored an average of 86 for my last 3 Mathematics tests, what must I score in my next exam to achieve an overall average of 88 for all exams.

Name SOLUTIONS Teacher _____

YEAR 7

SYDNEY TECHNICAL HIGH SCHOOL

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Name _____ Teacher _____

QUESTION 1 (15 marks) Answers in spaces provided

a) Find the value of Δ to make the number sentence true

i) $5 \times (\Delta + 6) = 45$ $\Delta =$ 3 1

ii) $\Delta \times \Delta \times \Delta = 8$ $\Delta =$ 2 1

iii) $\sqrt{\Delta} = 13$ $\Delta =$ 169 1

b) Simplify $(28 - 7) \times 4 - 2 =$ 82 1

c) Simplify $20 + 6 \times 5 - 50 =$ 0 1

d) If Δ is replaced by 8 evaluate $5 \times (19 - \Delta) \div 11 =$ 5 1

e) Write MMCMLXXIV using Hindu-Arabic numerals 2974 1

f) Write the basic numeral for

$5 \times 10^6 + 3 \times 10^4 + 2 \times 10 =$ 5,030,020 1

g) Write 1979 in Roman Numerals MCMLXXIX 1

h) Simplify $18 \div [24 - 6 \times 3]$ 3 1

i) Insert grouping symbol to make the expression below true 1

$12 - (4 - 3) = 11$

Name_____ Teacher_____

j) Fill in the empty boxes to complete this magic square 2

Note: In a magic square all vertical, horizontal and diagonal lines have the same total

4	11	6
9	7	5
8	3	10

k) If 15 metres of material costs $27, what is the cost of 10 metres of 2

the same material?

$18

QUESTION 2 (15 marks) Answers in spaces provided

a) True or False? 1

$15 + 5 \times 2 - 6 = 19$ True

b) Find $\sqrt{\frac{1}{4}}$ 1/2 1

c) Find $\sqrt[3]{125}$ 5 1

d) Find the cube of 4 64 1

e) Write all the prime numbers between 10 and 20

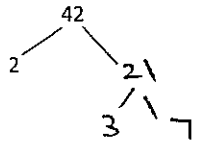
11, 13, 17, 19 1

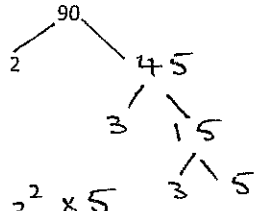
f) " A number that is not prime is called a composite number" 1

Write the missing word in the space provided.

Name_____ Teacher_____

g) Complete the factor trees below to write 42 and 90 as a product of their prime factors.





42= $2 \times 3 \times 7$

90= $2 \times 3^2 \times 5$ 2

h) Using your answers to part g) above write the 2

H.C.F. (highest common factor) of 42 and 90 in factored form

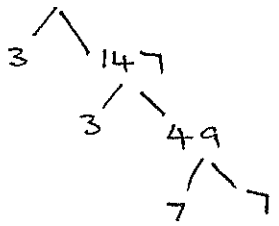
2×3

L.C.M. (lowest common multiple) of 42 and 90 in factored form

$2 \times 3^2 \times 5 \times 7$

i) Find $\sqrt{3^6 \times 7^2}$ $3^3 \times 7 = 189$ 1

j) i) Write 441 as a product of its prime factors (hint: use a factor tree) 1



$3^2 \times 7^2$

ii) Use your answer to part i) above to find $\sqrt{441}$ $3 \times 7 = 21$ 1

k) Find $(-2^3) \times -5 =$ 40 1

l) Find $10 + -4 - -5 - 8 =$ 3 1

Name_____ Teacher_____

QUESTION 3 (15 marks) Working in spaces provided

a) 67 × 2 = 134

b) 9833 - 4097 = 5736

c) $6\overline{)1157}$ = $192\frac{5}{6}$ (express remainder as a fraction) 2

d) $4.40 + $97.35 + 74 cents 2

$102.49

e) $51.92 ÷ 8 2

$6.49

f) Complete the pattern by filling in the boxes 2

3 , 4 → 24

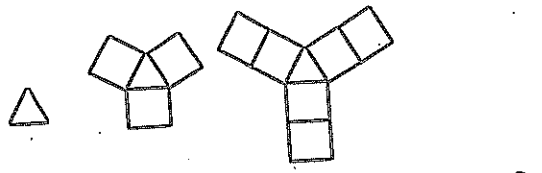
7 , 2 → 28

6 , 6 → 72

3 , 9 → 54

Name_____ Teacher_____

g) This match pattern shows SQUARES that grow outwards from an EQUILATERAL TRIANGLE at the centre. Extra matches are added in each shape. 3

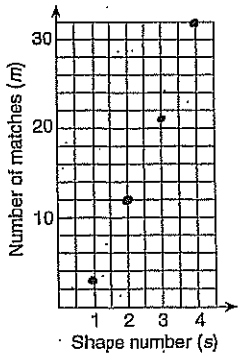


Shape 1 Shape 2 Shape 3

i) Complete the table below to show the pattern where s stands for the shape and m stands for number of matches used in each shape.

s	1	2	3	4
m	3	12	21	30

ii) Use the values in the table to plot the points from the above table on the number plane below



Question 4 (15 marks) SHOW ALL WORKING IN SPACE PROVIDED

a) Find $26\overline{)963}$ = $37\frac{1}{26}$ (leave the remainder as a fraction) 2

78

183

Name_____ Teacher_____

b) From the sum of 94 and 48 subtract 76 2

66

c) For a school excursion, 127 students need to travel by bus. If the bus can only seat 48 students , how many buses are required? (explain your answer) 2

$48\overline{)127}$ $\frac{2}{}$ $\frac{31}{58}$ ∴ 3 buses

d) The circumference of a bicycle wheel is $2\frac{1}{2}$ metres. How far does the cyclist travel in 1000 turns of the wheel? (answer in km) 2

2500m = 2.5km

e) A petrol station sold 330,000 litres of petrol during September. What was the average number of litres sold per day during that month? 2

$\frac{330\,000}{30}$ 11,000 L/day

f) i) Write the next 2 lines of the pattern below 1

$1 = 1 = 1^2$

$1 + 3 = 4 = 2^2$

$1 + 3 + 5 = 9 = 3^2$

$1+3+5+7 = 16 = 4^2$

$1+3+5+7+9 = 25 = 5^2$

ii) Use this pattern to find the sum of the first 10 odd numbers. 1

100

iii) How many odd numbers when added in order will give a sum of 361? 1

19

Name_____ Teacher_____

g) The temperature in Canberra at midnight one day in June is –3°C. The temperature in Mildura is 4°C. How much warmer is it in Mildura than in Canberra? _____ 1

7°C

h) Rose's bank account was overdrawn. She paid in $100. This made the balance $41 exactly. By how much had the account been overdrawn? 1

$59

QUESTION 5 (10 marks) SHOW WORKING IN SPACE PROVIDED

(2 marks each)

a) Increase 679 by the product of 72 and 9

1327

b) I plan to buy an item with the cash price of $105. I have saved $25 already and plan to save $7 a month for the next 12 months. Will I have enough to buy the item? (explain your answer)

$25 + 7 \times 12 = \$109$

will have $4 more than needed

c) Each time a girl makes a phone call to her friend, her father charges her 20c. This amount is subtracted from her allowance of $8 a week. How many calls can she afford to make in one week before her allowance would fall to $4.

$\$4 \div 20$ 20 calls

d) John purchased a table for $132 and a radio for $86. After sending $26.50 on repairs, he sold the two items to a customer for $349.95. How much profit did he make altogether on the 2 items.

Cost = $132 + 86 + 26.50 = \$244.50$

profit $105.45

e) If I scored an average of 86 [illegible]y last 3 Mathematics tests, what must I score in my next exam to achieve a [illegible]erall average of 88 for all exams. 94