SYDNEY TECHNICAL HIGH SCHOOL

Year 7

MAY COMMON TEST

2016

Mathematics

General Instructions:

- Working time – 65 minutes
- Write using black and blue pen
- Calculators may not be used

Total marks - 75

- Attempt Questions 1 - 5
- All questions are of equal value

Name: _____

Teacher: _____

Section 1	Section 2	Section 3	Section 4	Section 5	Total
Number	Number Theory	Introductory Algebra	Directed Numbers	Miscellaneous	

Section 1	Number		(15 marks – 1 mark each)
1.	Evaluate 4852 + 378 26	6.	Write 91038 in expanded notation in index form.
2.	Find the difference between 527 and 48	7.	Evaluate $7 \times 8 - 8 \div 4$
3.	Find the product of 76 and 7	8.	Evaluate $4 \times 62 \times 25$
4.	Evaluate $3024 \div 9$	9.	True or False? $10 \leq 10$
5.	Evaluate $27 \times 83 + 73 \times 83$	10.	"In which year after 2016 will the digits form a palindromic number?"

11.	Evaluate $5003 \div 38$	14.	How many odd counting numbers less than 100, contain the digit 5?
12.	Find the counting number that would replace the ☐ to make the sentence true: $16 \times \square - 72 = 56$	15.	My age is 52. I was married 22 years ago and I graduated 9 years before that. How old was I when I graduated?
13.	Evaluate $\sqrt{4^3}$		

Section 2	Number Theory		(15 marks – 1 mark each)
1.	List all factors of 36.	6.	Write down the smallest number over 3000 which is divisible by 4.
2.	Write down the sum of the first 4 triangular numbers.	7.	Find the lowest common multiple of 6 and 8.
3.	Write down all prime numbers between 40 and 50.	8.	Find the highest common factor of 24 and 36.
4.	List the first 5 multiples of 9.	9.	Write down 3 consecutive odd numbers whose sum is 33.
5.	Express 18 as a product of its prime factors.	10.	Write down the first 5 numbers of the Fibonacci Sequence.

11.	Which counting number is neither prime or composite?	14.	Write the basic numeral for $6 \times 10^4 + 8 \times 10^2 + 7 \times 1$
12.	Evaluate $\sqrt[3]{2 \times 2 \times 2 \times 5 \times 5 \times 5}$		
13.	Given $36 = 2^2 \times 3^2$ and $45 = 3^2 \times 5$, find the a) HCF b) LCM		

Section 3 — Introductory Algebra — (15 marks – 1 mark each)

1. Write the next 2 numbers in the pattern below.

4, 6, 9, 13, ____, ____

2. Write the missing number in this pattern.

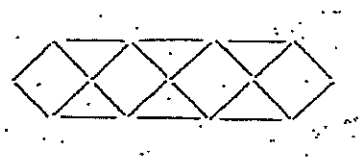
2000, 400, ____, 16, 3.2

3. If $y = 2x + 7$, find the value of y when $x = 8$

4. Write in simplest form $(3 \times C) \div M$

5. Write an algebraic expression for "Decrease $3x$ by 2".

6a)



N is the number of matchsticks needed to make a design of the form shown above.

S is the number of squares formed in the design.

Complete the table

S	1	2		4
N	4	10	16	

6b) Write a rule connecting S and N

6c) How many matches are needed for 100 squares?

7. $7 = \frac{56}{x}$, Find the value of x

8. If a = 3 and b = 6, evaluate

a) $6a - b$

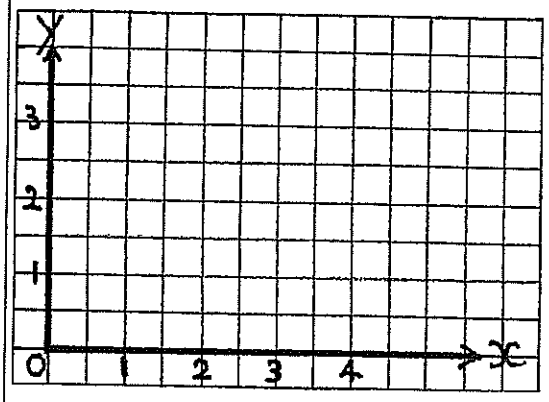
b) $3(a + b)$

c) $\frac{a}{b}$

9.

x	0	1	2	3
y	3	2	1	0

a) Using the table above, plot the points on the number plane below.

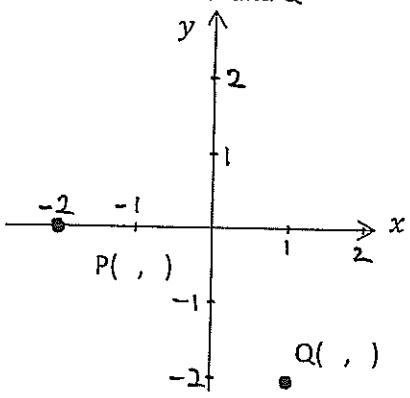


b) What do you notice about the 4 points?

c) Find the rule linking x and y in algebraic form.

Section 4 — Directed Numbers — (15 marks – 1 mark each)

1. Find the coordinates of P and Q



2. Evaluate

a) $-3 - 8 =$

b) $5 + -12 =$

c) $(2) + (-3) =$

d) $-4 - -9 =$

e) $-6 \times 9 =$

f) $-56 \div -7 =$

g) $(-3)^3 =$

h) $\frac{48}{-6} =$

i) Evaluate

$7 - [14 - (-3 - 8)]$

3. Two numbers have a sum of -4 and a product of -21. Find them.

4. Find the value of x if $-9x = 207$

5. If $x = -4$ and $y = -5$, evaluate

a) $2x + 3y$

b) $(xy)^2$

Section 5 — Miscellaneous — (15 marks – 1 mark each)

1. Evaluate

-2^2

2. Three friends shared 100 apples. Susan has x apples, Phil has 16 more than Susan and Owen has twice as many as Susan. Write simplified expressions in terms of x for the number of apples.

a) Phil has

b) Owen has

c) By writing an equation or otherwise, find the number of apples Susan has.

3. True or False?

$-5 + 5 \leq 0$

4. Add brackets to make this expression true

6 + 3 x 7 - 5 = 12

5. 1, 144, 2, 72, 4, 36, 12 are factors of 144. List all other pairs of factors.

6. Evaluate

99 x 87 - 89 x 87

7. Rewrite in simplest form:

m x 7 - n x 6

8. Evaluate

$3x^2$ if $x = -2$

9. Solve for x.

$12 - x = 18$

10. If 7 people share $63420, how much does each person receive?

11. Insert +, -, x, ÷ or grouping symbols into the number sentence below to make it true:

5 4 8 4 = -5

12. Evaluate

$\sqrt[3]{-64}$

13. Evaluate

5 - 5 x 5 ÷ 5 + 5

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MAY COMMON TEST

2016

Mathematics

General Instructions:

- Working time – 65 minutes
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- Calculators may not be used

Total marks - 75

- Attempt Questions 1 - 5
- All questions are of equal value

Name: _____

Teacher: _____

Section 1	Section 2	Section 3	Section 4	Section 5	Total
Number	Number Theory	Introductory Algebra	Directed Numbers	Miscellaneous	

Section 1	Number		(15 marks – 1 mark each)
1.	Evaluate $^{1}4852 + {}^{1}378 + {}^{1}26 = 5256$	6.	Write 91038 in expanded notation in index form. $9\times10^{4}+1\times10^{3}+3\times10+8\times1$
2.	Find the difference between 527 and 48 $^{1}5{}^{1}27 - {}^{1}48 = 479$	7.	Evaluate 7 x 8 - 8 ÷ 4 56 - 2 54
3.	Find the product of 76 and 7 $^{4}76\times 7 = 532$	8.	Evaluate 4 x 62 x 25 6200
4.	Evaluate 3024 ÷ 9 $9\overline{)3024} = 336$	9.	True or False? 10 ≤ 10 T
5.	Evaluate 27 x 83 + 73 x 83 8300	10.	"In which year after 2016 will the digits form a palindromic number?" 2112

11.	Evaluate 5003 ÷ 38 $38\overline{)5003}$ → 131 R 25 / 38 38 120 114 63 38 25	14.	How many odd counting numbers less than 100, contain the digit 5? 5, ~~50~~, 57, 95 15, 51, ~~58~~ 25, ~~52~~, 59 35, 53, 65 45, ~~54~~, 75 55, ~~56~~, 85 14
12.	Find the counting number that would replace the ☐ to make the sentence true: 16 × ☐ − 72 = 56 16 × ☐ = 128 ☐ = 8	15.	My age is 52. I was married 22 years ago and I graduated 9 years before that. How old was I when I graduated? 21
13.	Evaluate $\sqrt{4^3}$ $\sqrt{64} = 8$		

Section 2	Number Theory	(15 marks – 1 mark each)	
1.	List all factors of 36. 1, 36, 2, 18, 3, 12, 4, 9, 6 ✓	6.	Write down the smallest number over 3000 which is divisible by 4. 3004
2.	Write down the sum of the first 4 triangular numbers.  1 + 3 + 6 + 10 = 20	7.	Find the lowest common multiple of 6 and 8. 24
3.	Write down all prime numbers between 40 and 50. 41, 43, 47,	8.	Find the highest common factor of 24 and 36. 12
4.	List the first 5 multiples of 9. 9, 18, 27, 36, 45	9.	Write down 3 consecutive odd numbers whose sum is 33. 9, 11, 13
5.	Express 18 as a product of its prime factors. 2×3^2 or $2 \times 3 \times 3$	10.	Write down the first 5 numbers of the Fibonacci Sequence. 1, 1, 2, 3, 5

11.	Which counting number is neither prime or composite? 1	14.	Write the basic numeral for $6 \times 10^4 + 8 \times 10^2 + 7 \times 1$ 60807
12.	Evaluate $\sqrt[3]{2 \times 2 \times 2 \times 5 \times 5 \times 5}$ 2×5 $= 10$		
13.	Given $36 = 2^2 \times 3^2$ and $45 = 3^2 \times 5$, find the a) HCF $3^2 = 9$ b) LCM $2^2 \times 3^2 \times 5$ $= 180$		

Section 3 — Introductory Algebra — (15 marks – 1 mark each)

1. Write the next 2 numbers in the pattern below.

4, 6, 9, 13, 18, 24

2. Write the missing number in this pattern.

2000, 400, 80, 16, 3.2

3. If $y = 2x + 7$, find the value of y when $x = 8$

$y = 2 \times 8 + 7$

$= 23$

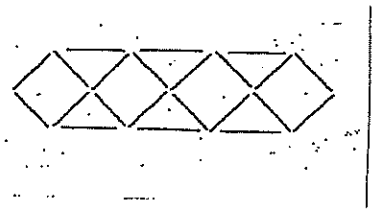
4. Write in simplest form $(3 \times C) \div M$

$$\frac{3C}{M}$$

5. Write an algebraic expression for "Decrease $3x$ by 2".

$3x - 2$

6a)



N is the number of matchsticks needed to make a design of the form shown above.

S is the number of squares formed in the design.

Complete the table

S	1	2	3	4
N	4	10	16	22

6b) Write a rule connecting S and N

$N = 6S - 2$

6c) How many matches are needed for 100 squares?

$N = 6 \times 100 - 2$

$= 598$

7. $7 = \frac{56}{x}$, Find the value of x

$x = 8$

8. If a = 3 and b = 6, evaluate

a) 6a – b $6 \times 3 - 6 = 12$

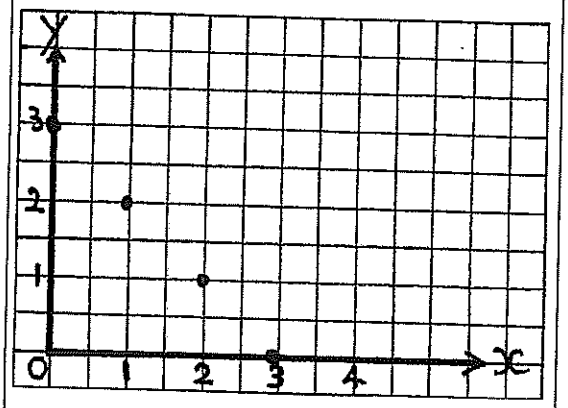
b) 3(a + b) $3(3+6) = 27$

c) $\frac{a}{b} = \frac{3}{6} = \frac{1}{2}$

9.

x	0	1	2	3
y	3	2	1	0

a) Using the table above, plot the points on the number plane below.



b) What do you notice about the 4 points?

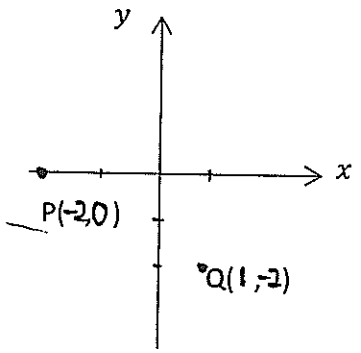
They lie in a "straight line"

c) Find the rule linking x and y in algebraic form.

$y = 3 - x$

Section 4 — Directed Numbers — (15 marks – 1 mark each)

1. Find the coordinates of P and Q



2. Evaluate

a) -3 - 8 = −11

b) 5 + -12 = −7

c) (2) + (-3) = −1

d) -4 - -9 = 5

e) -6 x 9 = −54

f) -56 ÷ -7 = 8

g) $(-3)^3$ = −27

h) $\frac{48}{-6}$ = −8

i) Evaluate

$7 - [14 - (-3 - 8)]$ $\quad -11$ $\quad = -18$

3. Two numbers have a sum of -4 and a product of -21. Find them.

−7, 3

4. Find the value of x if $-9x = 207$

$x = -23$

5. If $x = -4$ and $y = -5$, evaluate

a) $2x + 3y$

$-8 \quad -15 \quad = -23$

b) $(xy)^2$ = 400

Section 5 — Miscellaneous — (15 marks – 1 mark each)

1. Evaluate

-2^2

$= -4$

2. Three friends shared 100 apples. Susan has x apples, Phil has 16 more than Susan and Owen has twice as many as Susan. Write simplified expressions in terms of x for the number of apples.

a) Phil has $x + 16$

b) Owen has $2x$

c) By writing an equation or otherwise, find the number of apples Susan has.

$x + 2x + x + 16 = 100$

$x = 84$

Susan $= x = 21$

3. True or False?

$-5 + 5 \leq 0$ T

4. Add brackets to make this expression true

$6 + 3 \times (7 - 5) = 12$

5. 1, 144, 2, 72, 4, 36 are factors of 144. List all other pairs of factors.

6, 24, 8, 18, 9, 16 3, 48

6. Evaluate

99 x 87 - 89 x 87

870

7. Rewrite in simplest form:

m x 7 - n x 6

$7m - 6n$

8. Evaluate

$3x^2$ if $x = -2$ 12

9. Solve for x.

$12 - x = 18$ -6

10. If 7 people share $63420, how much does each person receive?

$7\overline{)63420}$ = 9060

$9060

11. Insert +, -, x, ÷ or grouping symbols into the number sentence below to make it true:

$5 \times (4 - 8) \div 4 = -5$

12. Evaluate

$\sqrt[3]{-64}$ -4

13. Evaluate

5 - 5 x 5 ÷ 5 + 5

$5 - 25 \div 5 + 5$

$5 - 5 + 5 = 5$