Name:	Teacher:

Gosford High School 2013

Year 11 Preliminary Mathematics Extension 1 Assessment Task #1

INSTRUCTIONS:

TIME: 60 minutes + 5 minutes reading time

- Write using blue or black pen.
- Board approved calculators may be used.
- In questions 5 7, show relevant mathematical reasoning and/or calculations

Questions 1 – 4	Multiple Choice	/4
Question 5	Algebra	/14
Question 6	Inequalities	/8
Question 7	Counting Techniques	/14
TOTAL		/40

Question 1:

Russel is answering an inequality and writes the answer

$$-2 \le x < 5$$
 and $x \ge 1$

This statement simplifies to:

a)
$$1 \le x \le 5$$

c)
$$1 \le x < 5$$

b)
$$1 < x \le 5$$

d)
$$1 < x < 5$$

Question 2:

Evaluate $2 \times \frac{3^{n+1}}{3^{n-1}}$

Question 3:

A committee of n people is to be chosen from n+1. Which of the following is **NOT EQUAL** to the number of committees possible:

a)
$$n+1C_n$$

b)
$$n+1P_n \div n!$$

c)
$$n+1P_n$$

d)
$$n+1$$

Question 4:

A bag contains 1 white and 5 black marbles. 5 will be taken from the bag and placed in a line. How many distinct arrangements are possible.

Fully factorise: a)

i)
$$(x+y)^2 - 2x - 2y$$

ii) $a^6 - b^6$ (2)

ii)
$$a^6 - b^6$$
 (2)

iii)
$$(x^2 + xy)^2 - (xy + y^2)^2$$
 (2)

b) Simplify
$$\frac{4^m \times 27^{m-n}}{6^{2m}}$$
 (2)

By factorising, find the result of dividing $2^{n+3} + 2^n$ by 3 c)

d) If
$$x + \frac{1}{x} = 3$$
 (Do not attempt to find x)

i) Show that
$$x^2 + \frac{1}{x^2} = 7$$
 (2)

ii) Hence find the value of
$$x^3 + \frac{1}{x^3}$$
 (2)

Question 6:

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a) Solve
$$\frac{2}{x+2} < 5$$

b) Solve
$$\frac{x+2}{(x-5)(x+4)} \ge 0$$

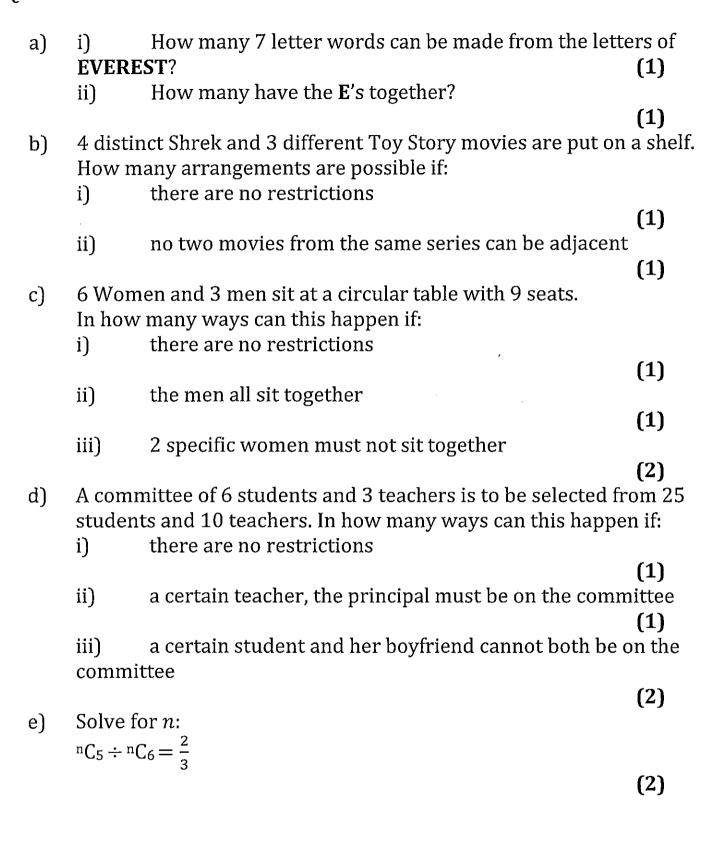
Find all positive values of x for which $\frac{6}{x} > x - 1$ c)

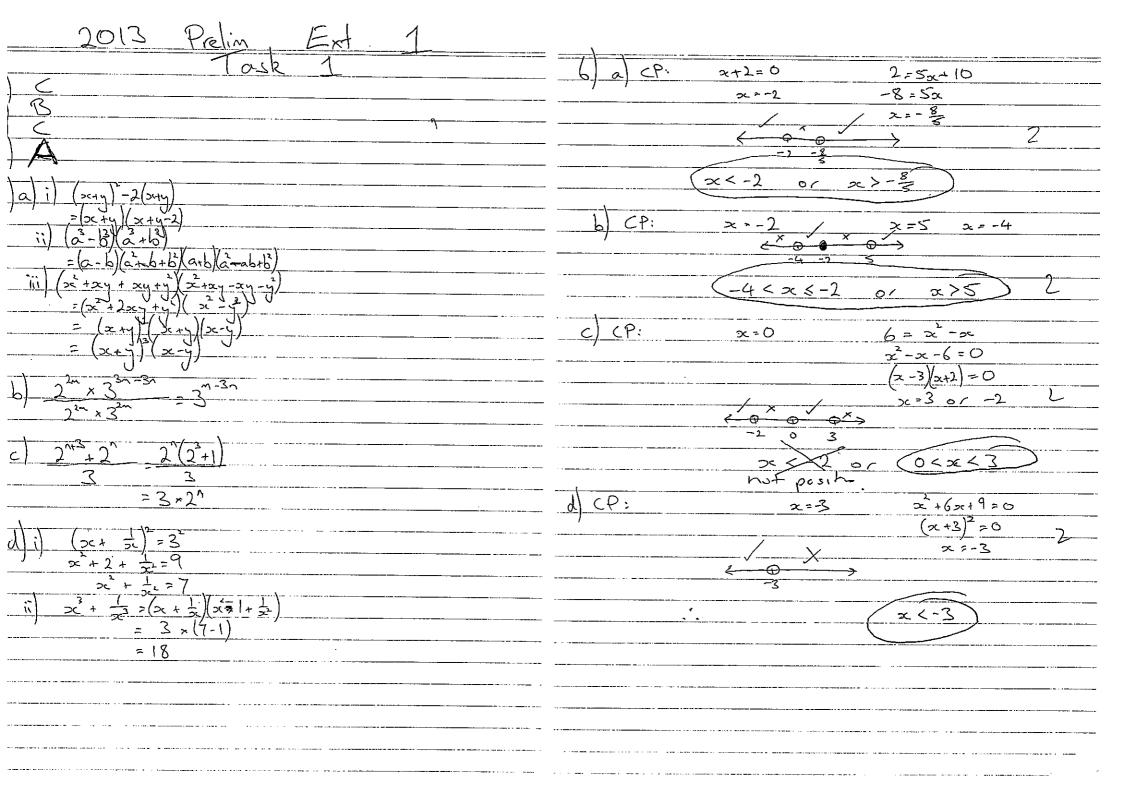
d) Solve
$$\frac{x+3}{x^2+6x+9} < 0$$

(2)

(2)

Question 7: START A NEW PAGE





7 \ \ \ \ 7 \ 7 \ \	
7 - 2 = 7	
3!	
ii) 5!	
11 4:x3!	
<u>ij</u> 4:x5:	
,	
dil 8!	
· 13 6! × 3!	
(i) 6! x 3! (ii) 8! - 7! x 2!	,
111/ 0. 1.721	
11. 25/ 10/	
$O(1)$ $C(x)$ C_2	
ii) 25(6 ×9(2	
11) 25 (x 10 (3 - 13 (4 x 10 (3	
e 25	
7(6 = 3	
n! _ 2	
h-5):5! (n-6):6! 3	
n! (n-6)! 6x5! 2	
6 = 2	
n-5 3	
18 = 2~-10	
N= 14	

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