Pre-Calculus 30 Outcome 11a Assessment 1

30.12 and 30.13	**2**	**3**	**4**
Outcome 11a: I can demonstrate understanding of permutations, combinations, and the binomial theorem	When specified I can demonstrate the process to: • Solve basic permutations • Apply the fundamental counting principle • Solve basic combinations • I can complete a missing row of Pascal's triangle I can determine missing numbers in expansions involving the binomial theorem.	When specified I can demonstrate the process to solve: • Permutations with repetitions When not specified solve level 2 questions I can apply the binomial theorem to expansions of (x+y)	I can solve equations involving permutations and combinations. I can apply the binomial theorem to expansions of (ax+by) Relate the binomial theorem to Pascal's triangle. Explain concepts relating to permutations and combinations. Complete all questions without error.

Level 2

Fundamental Counting Principle

1. A school cafeteria offers a soup and sandwich combo. There are 3 kinds of soup (pea, tomato, mushroom) and 4 kinds of sandwiches (egg salad, tuna, veggie, ham). How many possible combos are there?

2. In how many ways can the letters of the word LYNX be arranged?

Permutations

3. A music teacher must arrange 5 tunes for the senior jazz band to perform at Music Night. She has 20 tunes to choose from. How many arrangements are possible?

4. In the World Cup of soccer, 32 teams compete for the title. What is the number of ways that the winner, runners-up, third, and fourth place prizes could be awarded?

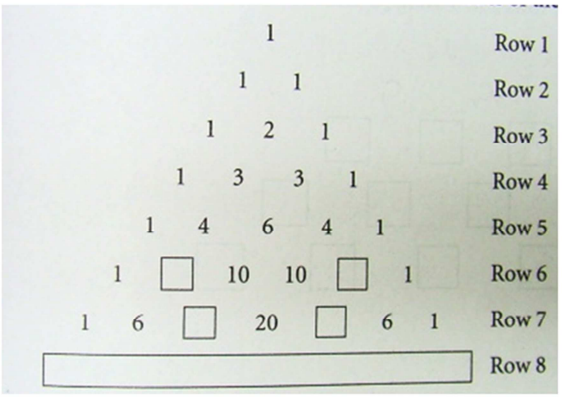
Combinations

5. How many 4-letter combinations can be formed using the letters in the word HOIDAS?

6. Rafael has a list of his mom's 15 favourite songs. In how many ways can he download 7 of these?

Pascal's Triangle

7. Complete rows 6-8 of Pascal's Triangle.



8. Determine each missing number in the expansion of $(x+y)^5$

$$1x^5 + \square x^4y + 10x^{\square}y^{\square} + 10x^2y^3 + 5x^1y^{\square} + 1y^5$$

Level 3

Permutations

9. How many permutations are there of the word KAYAK?

Permutation or Combination

10. A class contains 15 boys and 12 girls. How many different boy-girl dates are possible within the class?

11. From a group of 10 students, how many different committees of 4 students can be formed?

Binomial Theorem

12. Expand $(x+y)^4$ using the binomial theorem.

Level 4

13. Expand and simplify $(2c^4 - 1)^3$

14. Solve $_nP_3 = 120$ for n.

15. What is the difference between a permutation and a combination? Use an example to explain.