

Math Analysis Review Test 8.1-8.3, 8.6-8.7

[8.1] Write the first five terms of the sequence

1. $a_n = n(n+2)$

[8.2] Write the next term of the arithmetic sequence.

2. 23, 35, 47, 59, _____

3. 3.6, 1.2, -1.2, -3.6, _____

Find the specified term of each arithmetic sequence.

4. 25th term of 2, 8, 14, 20, ...

5. 51st term of 2, 0.2, -1.6, -3.4, ...

Find a formula for a_n for the arithmetic sequence.

6. $a_1 = 6, d = 4$

7. 4, 9, 14, 19, 24, ...

8. $a_1 = -3, a_5 = 17$

Find the indicated n th partial sum of the arithmetic series.

9. $15 + 25 + 35 + \dots, n = 50$

10. $a_1 = 2, a_{46} = 39, n = 40$

11. $\sum_{a=1}^{10} (-2a+1)$

12. $\sum_{a=3}^5 (6a-4)$

12. A brick patio has 20 rows of bricks, the first row has 14 bricks and the 20th row has 33 bricks. If the rows of bricks form an arithmetic sequence, how many bricks are in the patio?

[8.3] Write the next term of the geometric sequence.

13. 2, 10, 50, 250, _____

14. 6, -24, 96, -384, _____

Find the indicated n th term of the geometric sequence.

15. Find the 9th term of 96, 48, 24, ...

16. Find the 7th term if $a = 34$ and $r = 10$

17. $a_1 = 40, r = 1/2, n = 5$

18. 2, 12, 72, ... 9th term

Find the sum of each geometric series.

19. $256 + 128 + 64 + \dots + 1$

20. $\sum_{j=1}^4 0.5(2)^{j-1}$

21. $n = 5, a_1 = 243, r = 1/3$

22. Find a_1 if $S_n = -364, r = -3, n = 6$

Find the sum, if it exists, of each infinite geometric series.

23. $1 + 2 + 4 + 8 + \dots$

24. $20 + 16 + 64/5 + \dots$

25. $\sum_{n=1}^{\infty} 27 \left(\frac{1}{3}\right)^{n-1}$

[8.2 and 8.3]

Evaluate (some are arithmetic, some geometric)

26. $\sum_{n=1}^4 (2)^{n-1}$

27. $\sum_{l=1}^6 (2l+5)$

28. $\sum_{j=3}^7 (6j-10)$

29. $\sum_{k=4}^6 3(2)^{k-1}$

8.6 The Counting Principle

30. The cafeteria offers the following sandwiches: peanut butter, tuna, turkey, or ham; the following drinks: cola, lemonade, or milk; and the following desserts: pudding cup or ice cream bar. How many possible lunches are there if one sandwich, one drink, and one dessert are chosen?

31. How many different license plates can be made using 2 letters followed by 3 numbers with repetition allowed?

Over ...

8.6 Permutations

32. Find the number of permutations in the word STUDY.
33. There are 10 runners in a 50-yard dash. How many ways can the 1st, 2nd, and 3rd place be given?
34. How many even three-digit numbers can be formed from the digits 5,6,7,8,9 if no digit may be repeated in a number?
35. How many even three-digit numbers can be formed from the digits 5,6,7,8,9 if a digit may be repeated in a number?
36. How many permutations of the letters in the word BRAVE end with the letter "A"?
37. How many distinguishable permutations are there for the letters of the word POINSETTIA?

8.6 Combinations

38. How many different 4-member committees can be formed if 7 people are available for membership?
39. A student is given a chance of solving 4 out of 7 word problems. In how many different ways can the 4 problems be chosen?
40. A box of candy contains 5 dark chocolates, 4 milk chocolates, 2 nut chews, and 1 caramel candies. How many ways can the following candies be chosen? a) all milk chocolates, b) 3 dark chocolates and 2 milk chocolates.

8.7 Probability

41. Find the odds of an event occurring, given the probability is 3:10.
42. Find the probability of an event occurring, given the odds are 4:9.
43. A bag contains 5 yellow, 7 blue, and 6 purple marbles. What is the probability of randomly selecting
a) a blue marble b) a marble not yellow c) a black marble
44. A red die (r) and a green die (g) are tossed. What is the probability of the following outcomes?
a) $P(r \geq 5 \text{ or } g \leq 2)$ b) $P(r \geq 4 \text{ and } g \geq 5)$ c) $P(r + b < 5)$
45. A card is chosen at random from a well-shuffled deck of 52 cards. Find the probability of choosing a red card or a jack.
46. Give a sample space (or draw a tree diagram) for tossing 3 coins.
a) What is the probability of having 2 heads? b) What is the probability of having at least two heads?

Answers

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|--------------------|---------------|--------|-----------|-----------|
| ① 3, 8, 15, 24, 35 | ⑪ -100 | ⑳ 363 | ㉓ 676,000 | ㉗ 3/7 |
| ② 71 | ⑫ 60 ⑬ 470 | ㉑ 2 | ㉔ 120 | ㉘ 4/13 |
| ③ -6 | ⑭ 1250 | ㉒ None | ㉕ 720 | ㉙ a) 7/18 |
| ④ 146 | ⑮ 1536 | ㉓ 100 | ㉖ 24 | b) 13/18 |
| ⑤ -88 | ⑯ 3/8 | ㉔ 81/2 | ㉗ 50 | c) 0 |
| ⑥ $4n+2$ | ⑰ 34,000,000 | ㉕ 15 | ㉘ 24 | ㉚ 5/9 |
| ⑦ $5n-1$ | ⑱ 5/2 | ㉖ 15 | ㉙ 907,200 | b) 1/6 |
| ⑧ $5n-8$ | ㉒ 3,359,232 | ㉗ 72 | ㉚ 35 | c) 1/6 |
| ⑨ 13,000 | ㉓ 511 | ㉘ 100 | ㉛ 35 | ㉜ 7/13 |
| ⑩ 820 | ㉔ 7.5 | ㉙ 168 | ㉜ a) 1 | ㉝ a) 3/8 |
| | | ㉚ 24 | b) 60 | b) 1/2 |