

Chapter 11 & 12 Test Review

Find the specified term of the arithmetic sequence.

1. 50th term of 4, 7, 10 ...
2. 99th term with $t_1 = -25$ and $d = 8$

Find the specified term of the geometric sequence.

3. 6th term of 2, -6, 18 ...
4. 4th term of $t_1 = 500$ and $r = 0.2$

Find the missing terms in the arithmetic sequence.

5. 17, _____, _____, _____, 50

Find the missing terms in the geometric sequence.

6. 8, _____, _____, 27

Evaluate the expression.

7.
$$\sum_{k=1}^4 k^2 + 2$$

8.
$$\sum_{k=1}^4 \frac{24}{k!}$$

Find the partial sum for the arithmetic series.

9. S_{20} for $10 + 13.5 + 17 + \dots$
10. S_{12} for a series with $t_1 = 120$ and $d = -15$

Find the partial sum for the geometric series.

11. $S_6 = 3 + 6 + 12 + \dots$
12. S_5 for $t_1 = 4$ and $r = 2.5$

Arithmetic

$$\text{term}_n = \text{term}_1 + \text{difference}(n - 1)$$

$$\text{Sum}_n = n/2 (2 \text{ term}_1 + d(n - 1))$$

Geometric

$$\text{term}_n = \text{term}_1 \times \text{ratio}^{(n-1)}$$

$$\text{Sum}_n = \text{term}_1 \times \frac{1 - r^n}{1 - r}$$

$$\text{Limit} = \frac{\text{term}_1}{(1 - r)}$$

13. Simplify $\frac{85!}{81!}$

14: Simplify $\frac{200!}{198! 3!}$

15. Simplify $\frac{n!}{(n-2)!}$

16. Write as a ratio of factorials: $74 \cdot 74 \cdot 73 \cdot 72$

17. The letters of the word MISSISSIPPI are written on cards. Calculate the probability of drawing the following cards out of the stack:

- a. drawing an S, $P(S)$
- b. drawing a vowel, $P(\text{vowel}) =$
- c. drawing an P or S, $P(P \text{ or } S) =$
- d. not drawing an I, $P(\text{not I}) =$

18. A bag contains 4 red marbles, 5 blue marbles and 1 green marble. If you draw marbles from the bag and do not replace them, what is the probability of:

- a. selecting a red marble, $P(\text{red}) =$
- b. not selecting a red marble, $P(\text{not red}) =$
- c. selecting a red and then a blue marble, $P(\text{red, then blue}) =$
- d. selecting a red, then blue, then green marble, $P(\text{red, blue, green}) =$

19. You roll two die. What is the probability of rolling two 5's, $P(\text{two } 5\text{'s})?$

20. Using the letters in the word "ROCKET", how many different arrangements can be made:

- a. using all the letters once?
- b. using all the letters once and having the words start with "T"?
- c. using all the letters once, but starting with an R and ending with a vowel?
- d. using only four letters?

21. There are nine people in a room. How many ways can they arrange themselves:

- a. all 9 in a line.
- b. five of them in a line.
- c. in groups of 4

22. You have 4 pairs of pants, 5 different shirts, and two pairs of shoes.
- How many different combinations can you make using these options?
 - If you want to wear your favorite “Batman for President” shirt, how many combinations will you have to choose from?
23. There were 4 men and 8 women at the scout meeting. If they had to pick a group of 4 people, calculate the probability of picking a group made up of:
- two men and two women, $P(2 \text{ men}, 2 \text{ women}) =$
 - exactly one man, $P(\text{one man}) =$
 - all women, $P(\text{all women}) =$
24. Jacob has a 30% chance of going to a Spurs game. Becca has a 45% chance of going to the game. Calculate the probabilities of the following:
- Jacob not going to the game, $P(\text{no game for Jacob}) =$
 - neither one going to the game, $P(\text{no game for both}) =$
 - both go to the game, $P(\text{game for both}) =$
 - only one of them going, $P(\text{only one goes}) =$
25. The weatherman said there is an 80% chance of rain. If it rains, there is a 15% chance for hail.
- What is the probability that it will rain and hail?
 - What is the probability that it will rain, but not hail?
 - What is the probability that the weather will be nice (no rain or hail)?