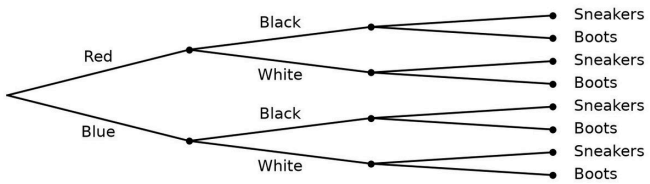
ALBERTA MATH 30-1 · 25 QUESTIONS

Permutations, Combinations & Binomial Theorem — Practice Test

This practice test was made by AI and there may be mistakes. If a question or answer looks wrong, use the Flag a mistake button to let Brett know so he can fix it.

1 **The tree diagram below shows all the outfits a student can make by choosing one shirt, one pair of pants, and one pair of shoes. The number of different outfits with a blue shirt is**



A 2

B 4

C 6

D 8

Understand It with Pulse

Flag a mistake

2 **Eight runners finish a race with no ties. The number of ways the first, second, and third place medals can be awarded is**

A 512

B 56

C 24

D 336

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3 **A student must choose 4 courses from 12 elective courses. The number of different selections the student can make is**

A 11880

B 495

C 48

D 144

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4 The coefficient of the x^3 term in the expansion of $(x + 2)^5$ is

- A 10
- B 20
- C 40
- D 80

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5 The number of different arrangements of all the letters in the word BANANA is

ANSWER _____

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6 **A security code consists of 4 digits, and digits may be repeated. If the code cannot begin with 0, the number of different codes is**

- A 9000
- B 10000
- C 6561
- D 5040

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7 **The number of different arrangements of all the letters in the word STATISTICS is**

- A 3628800
- B 604800
- C 50400
- D 100800

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8 **A committee of 5 people is to be selected from 9 women and 7 men. The number of committees that have at least 3 women is**

- A 2772
- B 1764
- C 4368
- D 1596

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9 **Five friends are seated in a row for a photograph. Aisha and Ben must sit next to each other. The number of different seating arrangements is**

- A 120
- B 48
- C 24
- D 72

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10 **In the expansion of $(2x - 3)^6$, the coefficient of the x^2 term is**

ANSWER _____

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11 **A reading list of 6 books is to be chosen from 10 novels and 8 biographies. The number of lists that contain exactly 4 novels is**

A 5880

B 18564

C 2100

D 2940

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12 **For a team photo, 7 players stand in a line. The tallest player must stand in the middle, and the shortest player must stand at one of the two ends. The number of arrangements is**

A 5040

B 720

C 120

D 240

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13 **Seven points are marked on the circumference of a circle, and polygons are formed by joining the points. The number of polygons with 3 or more sides that can be formed is**

A 35

B 91

C 99

D 112

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14 **The number of 3-digit or 4-digit PINs that can be formed using only the digits 1 to 8, with no digit repeated in a PIN, is**

ANSWER _____

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15 **The middle term in the expansion of $(x^2 - 2)^6$, written in descending powers of x, is**

A $160x^6$

B $-160x^6$

C $-20x^6$

D $60x^8$

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16 **There are 11 terms in the expansion of $(x - 3)^n$. The value of n is i, and the constant term in the expansion is ii.**

A n = 10 Constant term: 59049

B n = 11 Constant term: 59049

C n = 10 Constant term: -59049

D n = 9 Constant term: 19683

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17 **The number of arrangements of all the letters in the word BOOKKEEPER in which the three Es are together is**

A 151200

B 20160

C 5040

D 10080

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18 **In the expansion of $(x + 3)^8$, written in descending powers of x, the coefficient of the x^5 term is**

ANSWER _____

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19 **A committee of 4 people is to be selected from 8 students and 5 teachers. The number of committees that contain at most 1 teacher is**

A 350

B 280

C 715

D 70

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20 **Each member of a 5-member council votes yes or no on a motion. The number of voting patterns in which the motion passes (more yes than no) is**

- A 32
- B 10
- C 25
- D 16

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21 **Twelve students are divided into three groups of 4, and the groups are assigned to three different work stations. The number of ways this can be done is**

ANSWER _____

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22 **In the expansion of $(x + a)^n$, written in descending powers of x, the second term is $48x^5$ and the third term is $960x^4$. The values of a and n are**

- **A** a = 6 n = 8
- **B** a = 8 n = 6
- **C** a = 4 n = 6
- **D** a = 8 n = 5

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23 **In the expansion of $(x + 5)^{10}$, written in descending powers of x, the coefficient of the fourth term is**

ANSWER _____

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24 **Four girls and four boys stand in a line for a dance routine, alternating girl, boy, girl, boy, and so on. The number of different arrangements is**

A 576

B 40320

C 1152

D 288

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25 **A display is made by choosing 4 books from 6 math books and 5 physics books. If the display must contain at least 1 book of each type, the number of displays is**

ANSWER _____

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ANSWER KEY

1. B
2. D
3. B
4. C
5. 60
6. A
7. C
8. A
9. B
10. 4860
11. A
12. D
13. C
14. 2016
15. B
16. A
17. D
18. 1512
19. A
20. D
21. 34650
22. B
23. 15000
24. C
25. 310

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