A.N.7: Multiplication Counting Principle: Determine the number of possible events, using counting techniques or the Fundamental Principle of Counting

1   The local ice cream stand offers three flavors of soft-serve ice cream: vanilla, chocolate, and strawberry; two types of cone: sugar and wafer; and three toppings: sprinkles, nuts, and cookie crumbs. If Dawn does not order vanilla ice cream, how many different choices can she make that have one flavor of ice cream, one type of cone, and one topping?
1)   7
2)   8
3)   12
4)   18

2   How many different sandwiches consisting of one type of cheese, one condiment, and one bread choice can be prepared from five types of cheese, two condiments, and three bread choices?
1)   10
2)   13
3)   15
4)   30

3   A certain car comes in three body styles with a choice of two engines, a choice of two transmissions, and a choice of six colors. What is the minimum number of cars a dealer must stock to have one car of every possible combination?
1)   13
2)   36
3)   42
4)   72

4   When Kimberly bought her new car, she found that there were 72 different ways her car could be equipped. Her choices included four choices of engine and three choices of transmission. If her only other choice was color, how many choices of color did she have?
1)   6
2)   12
3)   60
4)   65

5   Juan has three blue shirts, two green shirts, seven red shirts, five pairs of denim pants, and two pairs of khaki pants. How many different outfits consisting of one shirt and one pair of pants are possible?
1)   19
2)   84
3)   130
4)   420

6   In a school building, there are 10 doors that can be used to enter the building and 8 stairways to the second floor. How many different routes are there from outside the building to a class on the second floor?
1)   1
2)   10
3)   18
4)   80

7   How many different outfits consisting of a hat, a pair of slacks, and a sweater can be made from two hats, three pairs of slacks, and four sweaters?
1)   9
2)   12
3)   24
4)   29

8   The school cafeteria offers five sandwich choices, four desserts, and three beverages. How many different meals consisting of one sandwich, one dessert, and one beverage can be ordered?
1)   1
2)   12
3)   3
4)   60

9   A deli has five types of meat, two types of cheese, and three types of bread. How many different sandwiches, consisting of one type of meat, one type of cheese, and one type of bread, does the deli serve?
1)   10
2)   25
3)   30
4)   75

10 Jeremy's bedroom has two doors leading into the hallway. His house has four doors leading to the outside. Using the doorways, in how many different ways can Jeremy leave his room and go outside?
1) 8
2) 6
3) 5
4) 4

11 Cole's Ice Cream Stand serves sixteen different flavors of ice cream, three types of syrup, and seven types of sprinkles. If an ice cream sundae consists of one flavor of ice cream, one type of syrup, and one type of sprinkles, how many different ice cream sundaes can Cole serve?
1) 10,836
2) 336
3) 3
4) 26

12 At a department store, there are six ways to enter the building, six ways to get from the first floor to the second floor, and four ways to get from the second floor to the third floor. In how many different ways could someone enter the building and go to the third floor?
1) 16
2) 24
3) 120
4) 144

13 There are 12 tomato plants in a garden. Each plant has 7 branches and each branch has four (4) tomatoes growing on it. If one-third of the tomatoes are picked, how many tomatoes were picked?
1) 23
2) 112
3) 224
4) 336

14 Robin has 8 blouses, 6 skirts, and 5 scarves. Which expression can be used to calculate the number of different outfits she can choose, if an outfit consists of a blouse, a skirt, and a scarf?
1) $8+6+5$
2) $8\cdot6\cdot5$
3) $8!6!5!$
4) $_{19}C_3$

15 Leo purchased five shirts, three pairs of pants, and four pairs of shoes. Which expression represents how many different outfits consisting of one shirt, one pair of pants, and one pair of shoes Leo can make?
1) $5\cdot3\cdot4$
2) $5+3+4$
3) $_{12}C_3$
4) $_{12}P_3$

16 Max goes through the cafeteria line and counts seven different meals and three different desserts that he can choose. Which expression can be used to determine how many different ways Max can choose a meal and a dessert?
1) $7\cdot3$
2) $7!\cdot3!$
3) $_7C_3$
4) $_7P_3$

17 Jen and Barry's ice cream stand has three types of cones, six flavors of ice cream, and four kinds of sprinkles. If a serving consists of a cone, one flavor of ice cream, and one kind of sprinkles, how many different servings are possible?
1) 90
2) 72
3) $_{13}C_3$
4) $_{13}P_3$

18 When the Smith family decided to have their new house built, they found that there were 60 different choices involving location, style, and color. If they had their choice of 2 locations and 5 styles, how many choices of color did they have?
1) 6
2) 12
3) 50
4) 53

19 Paloma has 3 jackets, 6 scarves, and 4 hats. Determine the number of different outfits consisting of a jacket, a scarf, and a hat that Paloma can wear.

20 Debbie goes to a diner famous for its express lunch menu. The menu has five appetizers, three soups, seven entrees, six vegetables, and four desserts. How many different meals consisting of either an appetizer or a soup, one entree, one vegetable, and one dessert can Debbie order?

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Answer Section

1 ANS: 3
$(3-1) \times 2 \times 3 = 12$

PTS: 2   REF: 080905ia
2 ANS: 4
$5 \times 2 \times 3 = 30$

PTS: 2   REF: 061002ia
3 ANS: 4
$3 \times 2 \times 2 \times 6 = 72$

PTS: 2   REF: 080111a
4 ANS: 1
$4 \times 3 \times x = 72$
$x = 6$

PTS: 2   REF: 010218a
5 ANS: 2
$(3+2+7) \times (5+2) = 84$

PTS: 2   REF: 080204a
6 ANS: 4
$10 \times 8 = 80$

PTS: 2   REF: 010405a
7 ANS: 3
$2 \times 3 \times 4 = 24$

PTS: 2   REF: 060403a
8 ANS: 4
$5 \times 4 \times 3 = 60$

PTS: 2   REF: 080404a
9 ANS: 3
$5 \times 2 \times 3 = 30$

PTS: 2   REF: 010503a
10 ANS: 1
$2 \times 4 = 8$

PTS: 2   REF: 060501a

11 ANS: 2

$16 \times 3 \times 7 = 336$

PTS: 2   REF: 080502a
12 ANS: 4

$6 \times 6 \times 4 = 144$

PTS: 2   REF: 060809a
13 ANS: 2   PTS: 2   REF: spring9814a
14 ANS: 2   PTS: 2   REF: 010612a
15 ANS: 1   PTS: 2   REF: 060607a
16 ANS: 1   PTS: 2   REF: 060728a
17 ANS: 2

$3 \times 6 \times 4 = 72$

PTS: 2   REF: 080704a
18 ANS: 1

$2 \times 5 \times x = 60$

$x = 6$

PTS: 2   REF: 080826a
19 ANS:

72. $3 \times 6 \times 4 = 72$

PTS: 2   REF: 089923a
20 ANS:

1,344. $(5 + 3) \times 7 \times 6 \times 4 = 1344$

PTS: 3   REF: 080636a