

A2.S.9: Differentiating Permutations and Combinations: Differentiate between situations requiring permutations and those requiring combinations

- 1 Twenty different cameras will be assigned to several boxes. Three cameras will be randomly selected and assigned to box A. Which expression can be used to calculate the number of ways that three cameras can be assigned to box A?
 - 1) $20!$
 - 2) $\frac{20!}{3!}$
 - 3) ${}_{20}C_3$
 - 4) ${}_{20}P_3$
- 2 There are 12 people on a basketball team, and the coach needs to choose 5 to put into a game. How many different possible ways can the coach choose a team of 5 if each person has an equal chance of being selected?
 - 1) ${}_{12}P_5$
 - 2) ${}_5P_{12}$
 - 3) ${}_{12}C_5$
 - 4) ${}_5C_{12}$
- 3 In a game, each player receives 5 cards from a deck of 52 different cards. How many different groupings of cards are possible in this game?
 - 1) ${}_{52}P_5$
 - 2) ${}_{52}C_5$
 - 3) $\frac{52!}{5!}$
 - 4) $5!$
- 4 A basketball squad has ten players. Which expression represents the number of five-player teams that can be made if John, the team captain, must be on every team?
 - 1) ${}_{10}C_5$
 - 2) ${}_9C_4$
 - 3) ${}_9P_4$
 - 4) ${}_{10}P_5$
- 5 A teacher wants to divide her class into groups. Which expression represents the number of different 3-person groups that can be formed from a class of 22 students?
 - 1) $3!$
 - 2) ${}_{22}C_3$
 - 3) ${}_{22}P_3$
 - 4) $22 \cdot 21 \cdot 20$
- 6 There are eight people in a tennis club. Which expression can be used to find the number of different ways they can place first, second, and third in a tournament?
 - 1) ${}_8P_3$
 - 2) ${}_8C_3$
 - 3) ${}_8P_5$
 - 4) ${}_8C_5$

- 7 Six people met at a dinner party, and each person shook hands once with everyone there. Which expression represents the total number of handshakes?
- $6!$
 - $6! \cdot 2!$
 - $\frac{6!}{2!}$
 - $\frac{6!}{4! \cdot 2!}$
- 8 A math club has 30 boys and 20 girls. Which expression represents the total number of different 5-member teams, consisting of 3 boys and 2 girls, that can be formed?
- ${}_{30}P_3 \cdot {}_{20}P_2$
 - ${}_{30}C_3 \cdot {}_{20}C_2$
 - ${}_{30}P_3 + {}_{20}P_2$
 - ${}_{30}C_3 + {}_{20}C_2$
- 9 A video-streaming service can choose from six half-hour shows and four one-hour shows. Which expression could be used to calculate the number of different ways the service can choose four half-hour shows and two one-hour shows?
- ${}_6P_4 \cdot {}_4P_2$
 - ${}_6P_4 + {}_4P_2$
 - ${}_6C_4 \cdot {}_4C_2$
 - ${}_6C_4 + {}_4C_2$
- 10 Three marbles are to be drawn at random, without replacement, from a bag containing 15 red marbles, 10 blue marbles, and 5 white marbles. Which expression can be used to calculate the probability of drawing 2 red marbles and 1 white marble from the bag?
- $\frac{{}_{15}C_2 \cdot {}_5C_1}{{}_{30}C_3}$
 - $\frac{{}_{15}P_2 \cdot {}_5P_1}{{}_{30}C_3}$
 - $\frac{{}_{15}C_2 \cdot {}_5C_1}{{}_{30}P_3}$
 - $\frac{{}_{15}P_2 \cdot {}_5P_1}{{}_{30}P_3}$
- 11 Which problem involves evaluating ${}_6P_4$?
- How many different four-digit ID numbers can be formed using 1, 2, 3, 4, 5, and 6 without repetition?
 - How many different subcommittees of four can be chosen from a committee having six members?
 - How many different outfits can be made using six shirts and four pairs of pants?
 - How many different ways can one boy and one girl be selected from a group of four boys and six girls?

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1	ANS: 3	REF: 061007a2
2	ANS: 3	REF: 010307a
3	ANS: 2	REF: 060426a
4	ANS: 2	REF: 010929a
5	ANS: 2	REF: 080816a
6	ANS: 1	REF: 011310a2
7	ANS: 4	REF: 081526a2
8	ANS: 2	REF: 011417a2
9	ANS: 3	REF: 061523a2
10	ANS: 1	REF: 011117a2
11	ANS: 1	REF: 061317a2