ALBERT

Name _____ Date _____

Permutations and Combinations Worksheet

Geometry · Common Core HSS-CP.B.9

> Use permutations and combinations to compute probabilities of compound events and solve problems.

Practice

Builds the skill step by step.

1. How many ways can 5 people line up?

2. How many ways can first, second and third place be awarded among 7 runners?

3. How many ways can 2 toppings be chosen from 6?

4. How many ways can 3 books be chosen from 10?

5. Choosing a president and a vice president from a club. Which do you use?

   A. a permutation, because order matters

   B. a combination, because order doesn't matter

   C. addition

   D. neither

6. How many ways can 4 books be arranged on a shelf?

7. How many 3-person committees can be chosen from 8 people?

8. How many ways can a president and a vice president be chosen from 10 people?

9. How many ways can 5 items be chosen from 5?

10. What is 0!?

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On Level

Grade-level practice.

1. A 3-person committee is chosen at random from 8 people, including Ana. What is P(Ana is on it)?

2. 5 people line up in random order. What is P(Ana is first)?

3. How many 4-digit codes use 4 different digits (0–9)?

4. How many different arrangements are there of the letters in BOOK?

5. A 5-card hand is dealt from a standard deck. What is P(all hearts)?

6. Explain when to use a permutation and when to use a combination, with an example of each.

7. How many ways can 2 boys be chosen from 5 and 2 girls from 4?

8. Two students are chosen at random from 5 boys and 4 girls. What is P(both girls)?

9. How many ways can gold, silver and bronze be awarded among 8 runners?

10. A lottery picks 6 numbers from 1 to 40, in any order. How many possible tickets are there?

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Challenge

Multi-step and word problems that stretch it.

1. How many different arrangements are there of the letters in MISSISSIPPI?

2. A 4-person committee is chosen at random from 6 women and 5 men. What is P(exactly 2 women)?

3. From that group (6 women, 5 men), a 4-person committee is chosen. What is P(at least one man)?

4. 6 people sit in a row. In how many arrangements are Al and Bo next to each other?

5. 6 people sit in a row at random. What is P(Al and Bo are next to each other)?

6. C(n, 2) = 28. What is n?

7. 12 people each shake hands once with everyone else. How many handshakes are there?

8. A 5-card hand is dealt from a standard 52-card deck. What is P(exactly one ace)?

9. A password is 3 letters (A–Z) followed by 2 digits (0–9), with repeats allowed. How many passwords are possible?

10. Which is always true?

    A. $C(n, r) > P(n, r)$

    B. $C(n, r) = C(n, n - r)$

    C. $C(n, r) = P(n, r)$

    D. $C(n, 0) = 0$