LESSON Practice B

EFF Permutations and Combinations

Use the Fundamental Counting Principle.

- 1. The soccer team is silk-screening T-shirts. They have 4 different colors of T-shirts and 2 different colors of ink. How many different T-shirts can be made using one ink color on a T-shirt?
- 2. A travel agent is offering a vacation package. Participants choose the type of tour, a meal plan, and a hotel class from the table below.

| Tour | Meal | Hotel |
|---------|------------|--------|
| Walking | Restaurant | 4-Star |
| Boat | Picnic | 3-Star |
| Bicycle | | 2-Star |
| | | 1-Star |

How many different vacation packages are offered?

Evaluate.

3. <u>3</u>!6! 3!

4. $\frac{10!}{7!}$

5. $\frac{9!-6!}{(9-6)!}$

Solve.

- 6. In how many ways can the debate team choose a president and a secretary if there are 10 people on the team?
- 7. A teacher is passing out first-, second-, and third-place prizes for the best student actor in a production of Hamlet. If there are 14 students in the class, in how many different ways can the awards be presented?

Evaluate.

| 8. | ₅ F | 7 4 |
|----|----------------|------------|
| | | |

9. ₃C₂

10. $_{8}P_{3}$

Solve.

- **11.** Mrs. Marshall has 11 boys and 14 girls in her kindergarten class this year.
 - a. In how many ways can she select 2 girls to pass out a snack? b. In how many ways can she select 5 boys to pass out new books? c. In how many ways can she select 3 students to carry papers to the office?

| | | 41 | | | | and Camb | lu allana | | |
|---|--|---|--|---|--|--|--|---|--|
| | ations and Combination Ital Counting Principle. | tions | | Use the Funda | | | oinations | | |
| | m, Susan can choose from 4 | types | | | | | s. They have 4 | different | |
| | bes of plants. If she chooses o type of plant, how many differ | | 12 | | | fferent colors ong one ink colo | f ink. How man r on a T-shirt? | y different | 8 T-shirts |
| 2. Lottery numbers | s in a particular state consist o | | | A travel age type of tour | ent is offering a r, a meal plan, | a vacation pack and a hotel cla | kage. Participan uss from the tab | nts choose th le below. | e |
| | ttery ball that is drawn has six How many different lottery nu | | 40.050 | | Tour | Meal | Hotel | | |
| are possible? | | | 46,656 | | Walking Boat | Restaurant Picnic | 4-Star 3-Star | | |
| Evaluate. | | | | | Bicycle | Tionio | 2-Star | | |
| 3. 5! | 4. <u>61</u> | ŧ | 5. $\frac{2!3!}{4!}$ | | | | 1-Star | | |
| 100 | 2 | CO | $\frac{1}{2}$ | How many | different vacat | ion packages a | are offered? | | 24 packages |
| 120 | 3 | 60 | 2 | Evaluate. | | . 10! | | _ 9 | 1 - 61 |
| Solve. | it, Craig has to choose 3 cera | amic mugs out | | 3. $\frac{3!6!}{3!}$ | | 4 . ^{10!} / _{7!} | | 5. (9 | $\frac{1-6!}{1-6!!}$ |
| of the 7 that he | made over the summer. In ho these 3 mugs in a row? | | 210 ways | | 720 | | 720 | | 60,360 |
| | f a track team want to choose | e a team | | Solve. | | | | | |
| captain and som | neone to organize their equipr can 2 people be chosen from | ment. In | | | | e debate team re 10 people or | choose a presi n the team? | ident | 90 ways |
| of 10 girls? | can 2 people be chosen non | n a leann | 90 ways | 7. A teacher is | s passing out f | irst-, second-, | and third-place | | |
| Evaluate. | | | | | | | n of <i>Hamlet</i> . If th fferent ways ca | | |
| 8. ₄ P ₃ | 9. ₃ C ₂ | 10 |). ₅ P ₂ | awards be | | , . | | | 2184 ways |
| 24 | | 3 | 20 | Evaluate. | | | | | |
| 11. ₅ C ₂ | 12. ₈ P ₄ | - | <u>20</u> 8. ₆ C ₁ | 8. ₅ P ₄ | | 9. ₃ C ₂ | | 10. ₈ P | 3 |
| | | | | | 120 | | 3 | | 336 |
| 10 | 16 | 680 | 6 | Solve. | | | | | |
| Solve. | | | | 11. Mrs. Marsh | all has 11 boys | s and 14 girls i | n her kindergar | ten class this | s year. |
| | on, Sandra wants to buy 2 wa | | | a. In how r a snack | | n she select 2 g | girls to pass out | | 91 ways |
| | rns she can choose from. In h ose 2 different wallets? | now many ways | 21 ways | | | n she select 5 b | ooys to pass ou | | · · · · |
| | 3 side dishes from a total of 1 nenu. In how many different w | | | new boo | | abo coloct 0 c | tudente te com | | 462 ways |
| choose his side | | | 120 ways | | to the office? | 1 She select 3 S | students to carr | y | 2300 ways |
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| | | | | | each | | | | |
| Practic | Ce C | | | Ket | | | | | |
| LESSON Practic | ce C ations and Combinat | tions | | LESSON Ret | | and Comb | inations | | |
| Evaluate. | ations and Combina | | | 11-1 Pern | nutations | | a group in whic | ch the order i | s |
| Permuta | ce C ations and Combinat 2. $\frac{6!}{3!(8-5)!}$ | | 3. <u>5!4!</u> 9! | A permutation important. In a | n is a selection a permutation, | of items from AB is NOT the | a group in whic same as <i>BA</i> . | | |
| Evaluate. 1. $\frac{7! - 4!}{(6 - 3)!}$ | ations and Combinat 2. <u>6!</u> <u>3!(8 - 5)!</u> | 3 | 1 | A permutation important. In a | n is a selection a permutation, a f permutations | of items from AB is NOT the | a group in whic | | |
| 11-1 <i>Permuta</i> Evaluate. 1. $\frac{7! - 4!}{(6 - 3)!}$ 836 | 2. <u>61</u> <u>3!(8 - 5)!</u> | 20 | <u>1</u> 126 | A permutation important. In a The number o | n is a selection a permutation, a f permutations ula. | n of items from AB is NOT the of <i>n</i> items take | a group in whic same as <i>BA</i> . en <i>r</i> at a time is | shown by th The value o | e f r must be less than |
| Evaluate. 1. $\frac{7! - 4!}{(6 - 3)!}$ | ations and Combinat 2. <u>6!</u> <u>3!(8 - 5)!</u> | 20 | 1 | A permutation important. In a The number o following form | n is a selection a permutation, a of permutations ula. ${}_{n}P_{r} =$ | n of items from <i>AB</i> is NOT the of <i>n</i> items take $\frac{n!}{(n-r)!}$ | a group in which same as <i>BA</i> . en <i>r</i> at a time is | shown by th The value o or equal to t | e f <i>r</i> must be less than the value of <i>n</i> . |
| 11-1 <i>Permuta</i> Evaluate. 1. $\frac{7! - 4!}{(6 - 3)!}$ 836 | ations and Combinat 2. $\frac{6!}{3!(8-5)!}$ <u>2</u> <u>5</u> $\frac{2}{7P_4}$ | 20 | <u>1</u> 126 | A permutation important. In a The number or following formut How many wa a secretary, ar | nutations n is a selection a permutation, if permutations ula. $_nP_r =$ any s can club me nd a treasurer | of items from <i>AB</i> is NOT the of <i>n</i> items take $\frac{n!}{(n-r)!}$ embers select a from a group o | a group in whic same as <i>BA</i> . en <i>r</i> at a time is a president, a v f 10 members? | The value o or equal to the | e f <i>r</i> must be less than the value of <i>n</i> . |
| 11-1 <i>Permuta</i> Evaluate. 1. $\frac{7! - 4!}{(6 - 3)!}$ 836 4. $_{10}C_5$ | ations and Combinat 2. $\frac{6!}{3!(8-5)!}$ 5. $\frac{2}{7P_4}$ | 2 <u>0 </u> | $\frac{\frac{1}{126}}{1_{10}C_9}$ | A permutation important. In a The number o following formu How many wa a secretary, ar Order matters | nutations n is a selection a permutation, . if permutations uia. $_{n}P_{r} =$ uys can club me a treasurer since each off | of items from <i>AB</i> is NOT the of <i>n</i> items take $\frac{n!}{(n-r)!}$ embers select a from a group o ice is different. | a group in which same as <i>BA</i> . en <i>r</i> at a time is a president, a v f 10 members? | The value o or equal to ice president | e f <i>r</i> must be less than the value of <i>n</i> . |
| 11-1 Permuta Evaluate. 1. $\frac{71-4!}{(6-3)!}$ 836 4. $_{10}C_5$ 252 | ations and Combinat 2. $\frac{6!}{3!(8-5)!}$ 5. $\frac{2}{7P_4}$ | 20 40 | $\frac{\frac{1}{126}}{1_{10}C_9}$ | HIED Perm A permutation important. In a The number o following formu- How many wa a secretary, an Order matters To find the nur n = 10 and r | nutations n is a selection a permutation, if permutations ula. $_{n}P_{r} =$ wys can club me nd a treasurer since each off mber of permu = 4 in the perm | of items from <i>AB</i> is NOT the of <i>n</i> items take $\frac{n!}{(n-r)!}$ | a group in which same as <i>BA</i> . en <i>r</i> at a time is a president, a v f 10 members? ems taken 4 at at hen evaluate. | The value o or equal to the ice president | e f r must be less than the value of n. |
| 11-1 <i>Permuta</i> Evaluate. 1. $\frac{71-4!}{(6-3)!}$ 836 4. $_{10}C_5$ 252 Compare. Write >, | ations and Combinat 2. $\frac{6!}{3!(8-5)!}$ 5. $\frac{2}{7P_4}$ 4. $\frac{2}{5}$ | 20 40 | $\frac{\frac{1}{126}}{\frac{1}{10}C_9}$ | HIED Perm A permutation important. In a The number o following formu- How many wa a secretary, an Order matters To find the nur n = 10 and r | nutations n is a selection a permutation, if permutations ula. $_{n}P_{r} =$ wys can club me nd a treasurer since each off mber of permu = 4 in the perm | of items from <i>AB</i> is NOT the of <i>n</i> items take $\frac{n!}{(n-r)!}$ | a group in which same as <i>BA</i> . en <i>r</i> at a time is a president, a v f 10 members? ems taken 4 at at hen evaluate. | The value o or equal to the ice president | e f r must be less than the value of n. |
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