Counting and Probability Foundations

Sets, counting principles, permutations, combinations, and probability basics.

Name _____ Date _____

32 main · 2-up grid · 11 pages · visible side quests

Completion Reward

Shown here as a small pack artifact, not a preview destination.

1. If there are 3 shirt choices and 4 pants choices, how many outfits are possible?

shirt	pants 1	pants 2	pants 3	pants 4
A	A1	A2	A3	A4
B	B1	B2	B3	B4
C	C1	C2	C3	C4

If each shirt can pair with each pair of pants, multiply the number of choices.

A. 7
B. 12
C. 1
D. 24

1.1. If there are 4 shirt choices and 3 pants choices, how many outfits are possible?

A. 7
B. 12
C. 24
D. 1

1.2. When does order matter?

A. when choosing a committee
B. when ranking first, second, and third
C. when picking 2 pizza toppings
D. when choosing a team

1.3. Choosing 3 students to represent a class is a:

A. permutation
B. combination
C. translation
D. sequence

1.4. Choosing president, vice president, and secretary from a club is a:

A. combination
B. permutation
C. set union
D. recursive rule

1.5. There are 2 routes, 4 lunch choices, and 3 activities. How many plans are possible?

A. 9
B. 12
C. 24
D. 36

2. When does order matter?

ordered outcome	counted as same?
AB	no
BA	no
committee {A,B}	yes

When rearranging the same choices makes a different outcome, order matters and the setting is a permutation situation.

A. Permutation problems
B. Combination problems only
C. Set notation only
D. Any counting problem with order irrelevant

2.1. If there are 4 shirt choices and 3 pants choices, how many outfits are possible?

A. 7
B. 12
C. 24
D. 1

2.2. When does order matter?

A. when choosing a committee
B. when ranking first, second, and third
C. when picking 2 pizza toppings
D. when choosing a team

2.3. Choosing 3 students to represent a class is a:

A. permutation
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2.4. Choosing president, vice president, and secretary from a club is a:

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B. 12
C. 24
D. 36

3. What is probability in a uniform setting?

outcome	favorable?
1	no
2	yes
3	no
4	yes
5	no
6	yes

In an equally likely setting, probability is the fraction of all outcomes that support the event.

A. Favorable outcomes divided by total outcomes
B. Total outcomes divided by favorable outcomes
C. The product of favorable and total outcomes
D. The sum of all outcomes

3.1. A fair die is rolled. What is the probability of rolling an even number?

A. 1/6
B. 1/3
C. 1/2
D. 2/3

3.2. A certain event has probability:

A. 0
B. 1
C. 1/2
D. it depends

3.3. An impossible event has probability:

A. 0
B. 1
C. -1
D. 2

3.4. In a uniform setting, probability compares:

A. favorable outcomes to total outcomes
B. outputs to inputs
C. slope to intercept
D. mean to median

3.5. If P(A) = 0.35, then P(not A) = ?

A. 0.35
B. 0.65
C. 1.35
D. 0.5

4. What does A union B mean?

A. Only the overlap of A and B
B. Elements in A but not B
C. All elements in A or B or both
D. The order of A followed by B

4.1. A union B means:

A. elements in A only
B. elements in both A and B at once only
C. elements in A or B or both
D. elements outside both sets

4.2. A intersection B means:

A. elements in either set
B. elements in both sets
C. elements in A only
D. elements in B only

4.3. Why subtract the overlap when finding n(A union B)?

A. to make the answer smaller on purpose
B. because the overlap was counted twice
C. because unions always subtract
D. because intersections are negative

4.4. If n(A) = 8, n(B) = 5, and n(A intersection B) = 2, then n(A union B) = ?

A. 11
B. 13
C. 15
D. 40

4.5. If two sets have no common elements, their intersection is:

A. the whole universe
B. empty
C. their union
D. a line

5. What does A intersection B mean?

A. All elements from A and B
B. Elements in A only
C. Elements common to both A and B
D. The size of set A

5.1. A union B means:

A. elements in A only
B. elements in both A and B at once only
C. elements in A or B or both
D. elements outside both sets

5.2. A intersection B means:

A. elements in either set
B. elements in both sets
C. elements in A only
D. elements in B only

5.3. Why subtract the overlap when finding n(A union B)?

A. to make the answer smaller on purpose
B. because the overlap was counted twice
C. because unions always subtract
D. because intersections are negative

5.4. If n(A) = 8, n(B) = 5, and n(A intersection B) = 2, then n(A union B) = ?

A. 11
B. 13
C. 15
D. 40

5.5. If two sets have no common elements, their intersection is:

A. the whole universe
B. empty
C. their union
D. a line

6. Which situation is a permutation?

A. Choosing 3 toppings for a pizza
B. Selecting 2 team captains without titles
C. Picking 4 books to borrow
D. Assigning gold, silver, and bronze medals

6.1. If there are 4 shirt choices and 3 pants choices, how many outfits are possible?

A. 7
B. 12
C. 24
D. 1

6.2. When does order matter?

A. when choosing a committee
B. when ranking first, second, and third
C. when picking 2 pizza toppings
D. when choosing a team

6.3. Choosing 3 students to represent a class is a:

A. permutation
B. combination
C. translation
D. sequence

6.4. Choosing president, vice president, and secretary from a club is a:

A. combination
B. permutation
C. set union
D. recursive rule

6.5. There are 2 routes, 4 lunch choices, and 3 activities. How many plans are possible?

A. 9
B. 12
C. 24
D. 36

7. Which situation is a combination?

A. Assigning first, second, and third place
B. Making a 4-digit code
C. Ordering 5 runners in a race
D. Choosing 3 club members for a committee

7.1. If there are 4 shirt choices and 3 pants choices, how many outfits are possible?

A. 7
B. 12
C. 24
D. 1

7.2. When does order matter?

A. when choosing a committee
B. when ranking first, second, and third
C. when picking 2 pizza toppings
D. when choosing a team

7.3. Choosing 3 students to represent a class is a:

A. permutation
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C. translation
D. sequence

7.4. Choosing president, vice president, and secretary from a club is a:

A. combination
B. permutation
C. set union
D. recursive rule

7.5. There are 2 routes, 4 lunch choices, and 3 activities. How many plans are possible?

A. 9
B. 12
C. 24
D. 36

8. What is the best first question when deciding between a permutation and a combination?

situation	order matters?
medals	yes
committee	no

The first decision between permutation and combination is whether changing the order creates a new outcome.

A. Are there any fractions?
B. Is the set empty?
C. Does order matter?
D. Can you graph the outcomes?

8.1. If there are 4 shirt choices and 3 pants choices, how many outfits are possible?

A. 7
B. 12
C. 24
D. 1

8.2. When does order matter?

A. when choosing a committee
B. when ranking first, second, and third
C. when picking 2 pizza toppings
D. when choosing a team

8.3. Choosing 3 students to represent a class is a:

A. permutation
B. combination
C. translation
D. sequence

8.4. Choosing president, vice president, and secretary from a club is a:

A. combination
B. permutation
C. set union
D. recursive rule

8.5. There are 2 routes, 4 lunch choices, and 3 activities. How many plans are possible?

A. 9
B. 12
C. 24
D. 36

9. A student adds n(A) + n(B) without subtracting the overlap. What goes wrong?

A. Elements in A disappear.
B. Elements in the overlap get counted twice.
C. The union becomes smaller than each set automatically.
D. The calculation only works for empty sets.

9.1. A union B means:

A. elements in A only
B. elements in both A and B at once only
C. elements in A or B or both
D. elements outside both sets

9.2. A intersection B means:

A. elements in either set
B. elements in both sets
C. elements in A only
D. elements in B only

9.3. Why subtract the overlap when finding n(A union B)?

A. to make the answer smaller on purpose
B. because the overlap was counted twice
C. because unions always subtract
D. because intersections are negative

9.4. If n(A) = 8, n(B) = 5, and n(A intersection B) = 2, then n(A union B) = ?

A. 11
B. 13
C. 15
D. 40

9.5. If two sets have no common elements, their intersection is:

A. the whole universe
B. empty
C. their union
D. a line

10. A cafe offers 2 sizes and 5 flavors. How many drink choices are there? Answer with a number.

10.1. If there are 4 shirt choices and 3 pants choices, how many outfits are possible?

A. 7
B. 12
C. 24
D. 1

10.2. When does order matter?

A. when choosing a committee
B. when ranking first, second, and third
C. when picking 2 pizza toppings
D. when choosing a team

10.3. Choosing 3 students to represent a class is a:

A. permutation
B. combination
C. translation
D. sequence

10.4. Choosing president, vice president, and secretary from a club is a:

A. combination
B. permutation
C. set union
D. recursive rule

10.5. There are 2 routes, 4 lunch choices, and 3 activities. How many plans are possible?

A. 9
B. 12
C. 24
D. 36

11. There are 3 routes, 2 lunch choices, and 4 activities. How many day plans are possible? Answer with a number.

11.1. If there are 4 shirt choices and 3 pants choices, how many outfits are possible?

A. 7
B. 12
C. 24
D. 1

11.2. When does order matter?

A. when choosing a committee
B. when ranking first, second, and third
C. when picking 2 pizza toppings
D. when choosing a team

11.3. Choosing 3 students to represent a class is a:

A. permutation
B. combination
C. translation
D. sequence

11.4. Choosing president, vice president, and secretary from a club is a:

A. combination
B. permutation
C. set union
D. recursive rule

11.5. There are 2 routes, 4 lunch choices, and 3 activities. How many plans are possible?

A. 9
B. 12
C. 24
D. 36

12. A fair die is rolled. What is the probability of getting an even number? Enter as a decimal. Answer with a number.

roll	even?
1	no
2	yes
3	no
4	yes
5	no
6	yes

Three of the six equally likely outcomes are even.

12.1. If there are 4 shirt choices and 3 pants choices, how many outfits are possible?

A. 7
B. 12
C. 24
D. 1

12.2. When does order matter?

A. when choosing a committee
B. when ranking first, second, and third
C. when picking 2 pizza toppings
D. when choosing a team

12.3. Choosing 3 students to represent a class is a:

A. permutation
B. combination
C. translation
D. sequence

12.4. Choosing president, vice president, and secretary from a club is a:

A. combination
B. permutation
C. set union
D. recursive rule

12.5. There are 2 routes, 4 lunch choices, and 3 activities. How many plans are possible?

A. 9
B. 12
C. 24
D. 36

13. A fair die is rolled. What is the probability of getting a number greater than 4? Enter as a decimal. Answer with a number.

13.1. If there are 4 shirt choices and 3 pants choices, how many outfits are possible?

A. 7
B. 12
C. 24
D. 1

13.2. When does order matter?

A. when choosing a committee
B. when ranking first, second, and third
C. when picking 2 pizza toppings
D. when choosing a team

13.3. Choosing 3 students to represent a class is a:

A. permutation
B. combination
C. translation
D. sequence

13.4. Choosing president, vice president, and secretary from a club is a:

A. combination
B. permutation
C. set union
D. recursive rule

13.5. There are 2 routes, 4 lunch choices, and 3 activities. How many plans are possible?

A. 9
B. 12
C. 24
D. 36

14. How many ways can 3 books be arranged on a shelf? Answer with a number.

14.1. If there are 4 shirt choices and 3 pants choices, how many outfits are possible?

A. 7
B. 12
C. 24
D. 1

14.2. When does order matter?

A. when choosing a committee
B. when ranking first, second, and third
C. when picking 2 pizza toppings
D. when choosing a team

14.3. Choosing 3 students to represent a class is a:

A. permutation
B. combination
C. translation
D. sequence

14.4. Choosing president, vice president, and secretary from a club is a:

A. combination
B. permutation
C. set union
D. recursive rule

14.5. There are 2 routes, 4 lunch choices, and 3 activities. How many plans are possible?

A. 9
B. 12
C. 24
D. 36

15. How many 2-person committees can be chosen from 4 people? Answer with a number.

pair 1	pair 2	pair 3
AB	AC	AD
BC	BD	CD

Combinations list each unordered pair only once.

15.1. If there are 4 shirt choices and 3 pants choices, how many outfits are possible?

A. 7
B. 12
C. 24
D. 1

15.2. When does order matter?

A. when choosing a committee
B. when ranking first, second, and third
C. when picking 2 pizza toppings
D. when choosing a team

15.3. Choosing 3 students to represent a class is a:

A. permutation
B. combination
C. translation
D. sequence

15.4. Choosing president, vice president, and secretary from a club is a:

A. combination
B. permutation
C. set union
D. recursive rule

15.5. There are 2 routes, 4 lunch choices, and 3 activities. How many plans are possible?

A. 9
B. 12
C. 24
D. 36

16. If set A has 8 elements, set B has 7 elements, and they share 3 elements, how many are in A union B? Answer with a number.

n(A)	n(B)	n(A intersection B)	n(A union B)
8	7	3	12

Add both sets and subtract the shared part once.

16.1. If there are 4 shirt choices and 3 pants choices, how many outfits are possible?

A. 7
B. 12
C. 24
D. 1

16.2. When does order matter?

A. when choosing a committee
B. when ranking first, second, and third
C. when picking 2 pizza toppings
D. when choosing a team

16.3. Choosing 3 students to represent a class is a:

A. permutation
B. combination
C. translation
D. sequence

16.4. Choosing president, vice president, and secretary from a club is a:

A. combination
B. permutation
C. set union
D. recursive rule

16.5. There are 2 routes, 4 lunch choices, and 3 activities. How many plans are possible?

A. 9
B. 12
C. 24
D. 36

17. Out of 20 students, 6 are absent. How many are present? Answer with a number.

17.1. If there are 4 shirt choices and 3 pants choices, how many outfits are possible?

A. 7
B. 12
C. 24
D. 1

17.2. When does order matter?

A. when choosing a committee
B. when ranking first, second, and third
C. when picking 2 pizza toppings
D. when choosing a team

17.3. Choosing 3 students to represent a class is a:

A. permutation
B. combination
C. translation
D. sequence

17.4. Choosing president, vice president, and secretary from a club is a:

A. combination
B. permutation
C. set union
D. recursive rule

17.5. There are 2 routes, 4 lunch choices, and 3 activities. How many plans are possible?

A. 9
B. 12
C. 24
D. 36

18. How many ways can 2 winners be chosen for president and vice president from 4 people? Answer with a number.

18.1. If there are 4 shirt choices and 3 pants choices, how many outfits are possible?

A. 7
B. 12
C. 24
D. 1

18.2. When does order matter?

A. when choosing a committee
B. when ranking first, second, and third
C. when picking 2 pizza toppings
D. when choosing a team

18.3. Choosing 3 students to represent a class is a:

A. permutation
B. combination
C. translation
D. sequence

18.4. Choosing president, vice president, and secretary from a club is a:

A. combination
B. permutation
C. set union
D. recursive rule

18.5. There are 2 routes, 4 lunch choices, and 3 activities. How many plans are possible?

A. 9
B. 12
C. 24
D. 36

19. How many ways can 2 students be chosen from 5 for a committee? Answer with a number.

19.1. If there are 4 shirt choices and 3 pants choices, how many outfits are possible?

A. 7
B. 12
C. 24
D. 1

19.2. When does order matter?

A. when choosing a committee
B. when ranking first, second, and third
C. when picking 2 pizza toppings
D. when choosing a team

19.3. Choosing 3 students to represent a class is a:

A. permutation
B. combination
C. translation
D. sequence

19.4. Choosing president, vice president, and secretary from a club is a:

A. combination
B. permutation
C. set union
D. recursive rule

19.5. There are 2 routes, 4 lunch choices, and 3 activities. How many plans are possible?

A. 9
B. 12
C. 24
D. 36

20. A fair coin is tossed twice. What is the probability of getting exactly one head? Enter as a decimal. Answer with a number.

HH	HT	TH	TT
0 heads	1 head	1 head	0 heads

Exactly one head occurs in two of the four equally likely outcomes.

20.1. If there are 4 shirt choices and 3 pants choices, how many outfits are possible?

A. 7
B. 12
C. 24
D. 1

20.2. When does order matter?

A. when choosing a committee
B. when ranking first, second, and third
C. when picking 2 pizza toppings
D. when choosing a team

20.3. Choosing 3 students to represent a class is a:

A. permutation
B. combination
C. translation
D. sequence

20.4. Choosing president, vice president, and secretary from a club is a:

A. combination
B. permutation
C. set union
D. recursive rule

20.5. There are 2 routes, 4 lunch choices, and 3 activities. How many plans are possible?

A. 9
B. 12
C. 24
D. 36

21. A bag has 3 red and 2 blue marbles. What is the probability of drawing a blue marble? Enter as a decimal. Answer with a number.

color	count
red	3
blue	2
total	5

Probability compares the count of blue marbles with the total marbles in the bag.

21.1. If there are 4 shirt choices and 3 pants choices, how many outfits are possible?

A. 7
B. 12
C. 24
D. 1

21.2. When does order matter?

A. when choosing a committee
B. when ranking first, second, and third
C. when picking 2 pizza toppings
D. when choosing a team

21.3. Choosing 3 students to represent a class is a:

A. permutation
B. combination
C. translation
D. sequence

21.4. Choosing president, vice president, and secretary from a club is a:

A. combination
B. permutation
C. set union
D. recursive rule

21.5. There are 2 routes, 4 lunch choices, and 3 activities. How many plans are possible?

A. 9
B. 12
C. 24
D. 36

22. If the probability of rain is 0.3, what is the probability of no rain? Answer with a number.

22.1. A fair die is rolled. What is the probability of rolling an even number?

A. 1/6
B. 1/3
C. 1/2
D. 2/3

22.2. A certain event has probability:

A. 0
B. 1
C. 1/2
D. it depends

22.3. An impossible event has probability:

A. 0
B. 1
C. -1
D. 2

22.4. In a uniform setting, probability compares:

A. favorable outcomes to total outcomes
B. outputs to inputs
C. slope to intercept
D. mean to median

22.5. If P(A) = 0.35, then P(not A) = ?

A. 0.35
B. 0.65
C. 1.35
D. 0.5

23. If n(A) = 9, n(B) = 4, and n(A intersection B) = 2, find n(A union B). Answer with a number.

23.1. A union B means:

A. elements in A only
B. elements in both A and B at once only
C. elements in A or B or both
D. elements outside both sets

23.2. A intersection B means:

A. elements in either set
B. elements in both sets
C. elements in A only
D. elements in B only

23.3. Why subtract the overlap when finding n(A union B)?

A. to make the answer smaller on purpose
B. because the overlap was counted twice
C. because unions always subtract
D. because intersections are negative

23.4. If n(A) = 8, n(B) = 5, and n(A intersection B) = 2, then n(A union B) = ?

A. 11
B. 13
C. 15
D. 40

23.5. If two sets have no common elements, their intersection is:

A. the whole universe
B. empty
C. their union
D. a line

24. Find 5!. Answer with a number.

24.1. If there are 4 shirt choices and 3 pants choices, how many outfits are possible?

A. 7
B. 12
C. 24
D. 1

24.2. When does order matter?

A. when choosing a committee
B. when ranking first, second, and third
C. when picking 2 pizza toppings
D. when choosing a team

24.3. Choosing 3 students to represent a class is a:

A. permutation
B. combination
C. translation
D. sequence

24.4. Choosing president, vice president, and secretary from a club is a:

A. combination
B. permutation
C. set union
D. recursive rule

24.5. There are 2 routes, 4 lunch choices, and 3 activities. How many plans are possible?

A. 9
B. 12
C. 24
D. 36

25. How many 3-person committees can be chosen from 5 people? Answer with a number.

25.1. If there are 4 shirt choices and 3 pants choices, how many outfits are possible?

A. 7
B. 12
C. 24
D. 1

25.2. When does order matter?

A. when choosing a committee
B. when ranking first, second, and third
C. when picking 2 pizza toppings
D. when choosing a team

25.3. Choosing 3 students to represent a class is a:

A. permutation
B. combination
C. translation
D. sequence

25.4. Choosing president, vice president, and secretary from a club is a:

A. combination
B. permutation
C. set union
D. recursive rule

25.5. There are 2 routes, 4 lunch choices, and 3 activities. How many plans are possible?

A. 9
B. 12
C. 24
D. 36

26. How many ordered 2-person officer teams can be chosen from 5 people? Answer with a number.

26.1. If there are 4 shirt choices and 3 pants choices, how many outfits are possible?

A. 7
B. 12
C. 24
D. 1

26.2. When does order matter?

A. when choosing a committee
B. when ranking first, second, and third
C. when picking 2 pizza toppings
D. when choosing a team

26.3. Choosing 3 students to represent a class is a:

A. permutation
B. combination
C. translation
D. sequence

26.4. Choosing president, vice president, and secretary from a club is a:

A. combination
B. permutation
C. set union
D. recursive rule

26.5. There are 2 routes, 4 lunch choices, and 3 activities. How many plans are possible?

A. 9
B. 12
C. 24
D. 36

27. Write the simple probability formula. Answer as an equation.

27.1. If there are 4 shirt choices and 3 pants choices, how many outfits are possible?

A. 7
B. 12
C. 24
D. 1

27.2. When does order matter?

A. when choosing a committee
B. when ranking first, second, and third
C. when picking 2 pizza toppings
D. when choosing a team

27.3. Choosing 3 students to represent a class is a:

A. permutation
B. combination
C. translation
D. sequence

27.4. Choosing president, vice president, and secretary from a club is a:

A. combination
B. permutation
C. set union
D. recursive rule

27.5. There are 2 routes, 4 lunch choices, and 3 activities. How many plans are possible?

A. 9
B. 12
C. 24
D. 36

28. Write the set-count formula for A union B. Answer as an equation.

28.1. If there are 4 shirt choices and 3 pants choices, how many outfits are possible?

A. 7
B. 12
C. 24
D. 1

28.2. When does order matter?

A. when choosing a committee
B. when ranking first, second, and third
C. when picking 2 pizza toppings
D. when choosing a team

28.3. Choosing 3 students to represent a class is a:

A. permutation
B. combination
C. translation
D. sequence

28.4. Choosing president, vice president, and secretary from a club is a:

A. combination
B. permutation
C. set union
D. recursive rule

28.5. There are 2 routes, 4 lunch choices, and 3 activities. How many plans are possible?

A. 9
B. 12
C. 24
D. 36

29. Write 4! as a product. Answer as an equation.

29.1. If there are 4 shirt choices and 3 pants choices, how many outfits are possible?

A. 7
B. 12
C. 24
D. 1

29.2. When does order matter?

A. when choosing a committee
B. when ranking first, second, and third
C. when picking 2 pizza toppings
D. when choosing a team

29.3. Choosing 3 students to represent a class is a:

A. permutation
B. combination
C. translation
D. sequence

29.4. Choosing president, vice president, and secretary from a club is a:

A. combination
B. permutation
C. set union
D. recursive rule

29.5. There are 2 routes, 4 lunch choices, and 3 activities. How many plans are possible?

A. 9
B. 12
C. 24
D. 36

30. Write the combination expression for choosing 2 from 5. Answer as an expression.

30.1. If there are 4 shirt choices and 3 pants choices, how many outfits are possible?

A. 7
B. 12
C. 24
D. 1

30.2. When does order matter?

A. when choosing a committee
B. when ranking first, second, and third
C. when picking 2 pizza toppings
D. when choosing a team

30.3. Choosing 3 students to represent a class is a:

A. permutation
B. combination
C. translation
D. sequence

30.4. Choosing president, vice president, and secretary from a club is a:

A. combination
B. permutation
C. set union
D. recursive rule

30.5. There are 2 routes, 4 lunch choices, and 3 activities. How many plans are possible?

A. 9
B. 12
C. 24
D. 36

31. Write the complement rule for an event E. Answer as an equation.

31.1. A fair die is rolled. What is the probability of rolling an even number?

A. 1/6
B. 1/3
C. 1/2
D. 2/3

31.2. A certain event has probability:

A. 0
B. 1
C. 1/2
D. it depends

31.3. An impossible event has probability:

A. 0
B. 1
C. -1
D. 2

31.4. In a uniform setting, probability compares:

A. favorable outcomes to total outcomes
B. outputs to inputs
C. slope to intercept
D. mean to median

31.5. If P(A) = 0.35, then P(not A) = ?

A. 0.35
B. 0.65
C. 1.35
D. 0.5

32. Which student chooses the right method for selecting 2 toppings from 6 without order?

A. Student A: use a combination because order does not matter.
B. Student B: use a permutation because any two toppings are a ranking.
C. Student C: use a determinant because there are 6 choices.
D. Student D: use an exponential model because toppings branch.

32.1. If there are 4 shirt choices and 3 pants choices, how many outfits are possible?

A. 7
B. 12
C. 24
D. 1

32.2. When does order matter?

A. when choosing a committee
B. when ranking first, second, and third
C. when picking 2 pizza toppings
D. when choosing a team

32.3. Choosing 3 students to represent a class is a:

A. permutation
B. combination
C. translation
D. sequence

32.4. Choosing president, vice president, and secretary from a club is a:

A. combination
B. permutation
C. set union
D. recursive rule

32.5. There are 2 routes, 4 lunch choices, and 3 activities. How many plans are possible?

A. 9
B. 12
C. 24
D. 36