

1. In a photography exhibit, 6 photographs will be displayed in a row along one wall.
  - a. How many different ways can the photographs be displayed?
  
  
  
  
  
  
  
  
  
  
  - b. How many different ways can 3 of the photographs receive first prize, second prize, and honorable mention?
  
  
  
  
  
  
  
  
  
  
2. You want to make a fruit smoothie using 3 of the fruits listed below. How many different smoothies can you make?  
  
orange, strawberry, banana, pineapple, kiwi, watermelon, cantaloupe, peach
  
  
  
  
  
  
  
  
  
  
3. A code has 5 digits in a specific order. The digits can be 0-7. How many codes are possible if one digit may only be used once?
  
  
  
  
  
  
  
  
  
  
4. You must take 18 elective courses to meet your graduation requirements for college. There are 30 courses that you are interested in. How many different course selections are possible?
  
  
  
  
  
  
  
  
  
  
5. A password consists of 3 letters and 2 digits. Which password is more secure, one in which letters and digits can be reused or one in which they cannot be reused? Show each case and then explain.
  
  
  
  
  
  
  
  
  
  
6. How many distinguishable arrangements of the letters in the word TENNESSEE exist?
  
  
  
  
  
  
  
  
  
  
7. Use Pascal's triangle to expand  $(2x - 5)^4$ . What is the coefficient of the  $x^3$  term?

8. You have an equally likely chance of choosing any integer from 1 to 25. Find the probability of the given event:

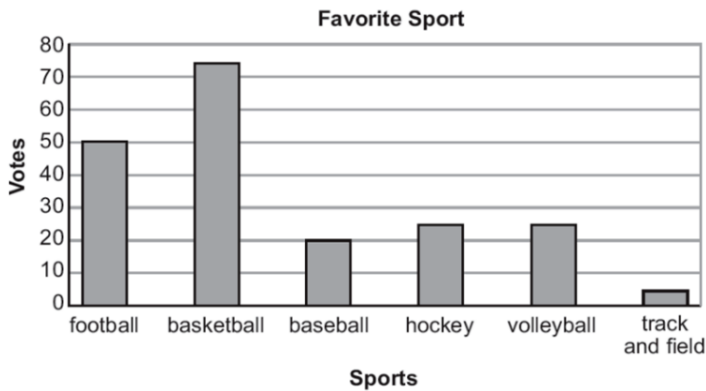
a. A number strictly less than 10 is chosen

b. A multiple of 3 is chosen

c. A prime number is chosen

d. A number that has a digit that is 5 is chosen

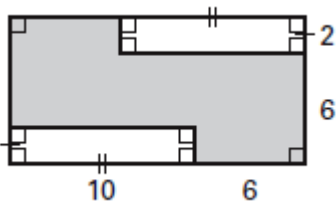
9. The graph shows the results of a survey that asked 9<sup>th</sup> grade students which sport they would most like to watch on TV.



a. Find the probability that a randomly selected 9<sup>th</sup> grade student would like to watch track and field.

b. Is your answer from part (a) a theoretical or experimental probability? Explain.

10. Find the probability that a randomly chosen point in the figure lies in the shaded region.



11. Simplify using a blue calculator only. Show all work.

a.  $11!$

b.  ${}_8P_2$

c.  ${}_{10}C_5$

d.  $0!$