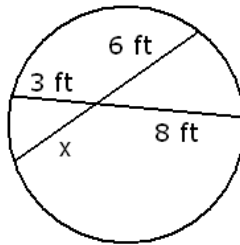


1. Expand  $(a + b)^7 =$
2. Find the present value of \$1000, ten years from now. Assume an annual compound interest rate of 5%, compounded
  - (a) annually
  - (b) monthly
  - (c) daily
  - (d) continuously.
3. Which is the better deal, to receive \$2000 now, or to receive \$3000 six years from now? (Assume an annual compound interest rate of 5%, compounded annually.)
4. Which is the better deal, to receive \$2000 now, or to receive \$3000 six years from now? (Assume an annual compound interest rate of 8%, compounded annually.)
5. Find  $\binom{12}{3} - \binom{12}{9} =$
6. In a certain lottery game, one has to pick 3 numbers out of the numbers  $\{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ . To win the game's super prize, one has to get all 3 numbers right. We buy one ticket and play our 3 numbers. What is the probability of us winning the super prize?
7. In a certain lottery game, one has to pick 6 numbers out of the numbers  $\{1, 2, 3, \dots, 44, 45\}$ . To win the game's super prize, one has to get all 6 numbers right. We buy one ticket and play our 6 numbers. What is the probability of us winning the super prize?
8. Teams A and B are the finalists in a championship. In every game, the probability of Team A winning is 60%, and the probability of Team B winning is 40%. The two teams will play games until one team wins two games. Find the probability of Team A winning the championship.
9. We toss a coin five times in a row. Find the probability that the number of tails is at least 1.

10. We pull two cards from a deck of 52, without replacement.
- (a) What is the probability that we pull two spades?
  - (b) What is the probability that we pull two cards of the same suit?
  - (c) What is the probability that we pull two cards of different suits?
  - (d) What is the probability that at least one of the two cards is red?
  - (e) What is the probability that at least one of the two cards is an ace?
11. We pull two cards from a deck of 52, with replacement.
- (a) What is the probability that we pull two spades?
  - (b) What is the probability that we pull two cards of the same suit?
  - (c) What is the probability that we pull two cards of different suits?
  - (d) What is the probability that at least one of the two cards is red?
  - (e) What is the probability that at least one of the two cards is an ace?
12. Find  $x$  based on the picture shown below.



13.  $ABC$  is a right triangle. Find the exact values of  $x$ ,  $y$ , and  $z$  based on the picture shown below.

