1. How many sequences of three capital letters can be made without repetition?

    a) 15,600   b) 2,600   c) 17,576   d) 4.03×10^{26} e) 226,920

2. A student's advisor tells her that for the coming semester, she must take one Humanities class, one Social Science class, one Science class and one Business class. She has three Humanities classes, four Social Science classes, three Science classes and two Business classes to choose from. Assuming there are no schedule conflicts, how many different sets of four classes are possible?

    a) 36   b) 48   c) 72   d) 12   e) 108

3. Evaluate $\dfrac{7!}{5!2!}$.

    a) 42   b) 12   c) 84   d) 102   e) 21

4. Evaluate P(5,3).

    a) 20   b) 15   c) 125   d) 60   e) 10

5. Evaluate C(6,4)

    a) 24   b) 1296   c) 15   d) 360   e) 4096

6. A club must choose a President, a Secretary and a Treasurer from their 35 members. How many different selections are possible?

    a) P(35,3)=39,270   b) C(35,3)=6,545   c) $35^3 = 42,870$ d) $35 \times 3 = 105$ e) $35 \times 3! = 210$

7. Rebecca has seven different types of flowers blooming in her garden. How many ways can she choose three different types to use in a cut flower arrangement?

    a) $7^3 = 343$ b) P(7,3)=210   c) C(7,3)=35   d) $7 \times 3 = 21$ e) $\dfrac{7!}{3!} = 840$

    For problems 8-10, use the following: On the planet Borthax, dice are not cubes but regular octahedrons (8 sides) so that any of the numbers 1-8 can come up on a single die. A popular game involves rolling two of these dice, one green and one blue.

8. What is the size of the sample space?

    a) 64   b) 32   c) 16   d) 256   e) 48

9. What is the probability of getting "doubles", the same number on both dice?

    a) 1/64   b) 1/32   c) 1/16   d) 1/8   e) 3/16

10. What is the probability that the sum of the two dice is 5?

    a) 1/64   b) 1/32   c) 1/16   d) 1/8   e) 1/4

11. The probability of an event E is $P(E) = 2/5$. What are the odds against E?

   a) 3:2   b) 5:2   c) 2:3   d) 5:3   e) 3:5

12. If the sample space is finite, and $P(E) = 0$, then E is

   a) independent   b) certain   c) impossible   d) mutually exclusive   e) possible, but unlikely

13. If $P(E) = 2/7$, then the probability that E does *not* occur is

   a) 2/5   b) 5/7   c) 7/2   d) 0   e) Can't be determined from the given information

14. Suppose for two events A and B, $P(A) = .3, P(B) = .5$, and $P(A \cup B) = .6$. What is $P(A \cap B)$?

   a) 1.4   b) .09   c) .2   d) .8   e) Can't be determined from the given information

For problems 26-28: Two cards are drawn from a standard deck of 52 cards, without replacement.

15. What is the probability of getting a pair (two cards of the same rank) given that the first card is an Ace?

   a) 1/13   b) 3/52   c) 3/51   d) 1/4   e) 3/4

16. What is the probability of getting a pair of Aces?

   a) 1.005   b) .0392   c) .0673   d) .00592   e) .00452

17. What is the probability of getting a pair (unspecified rank).

   a) .0588   b) .0741   c) .00639   d) .00135   e) .000519
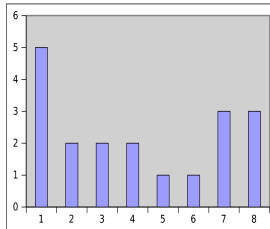
Problems 18-23 use this set of data:

```
4  8  5  5
8  4  3  7
4  2  2  6
4  1  8  6
```

18. Find the mean:

   a) 4.12   b) 4.81   c) 5.05   d) 5.23   e) 5.41

19. Find the median:

   a) 4.0   b) 4.5   c) 5.0   d) 5.5   e) 6.0

20. Find the standard deviation

   a) 1.79   b) 2.09   c) 2.23   d) 2.45   e) 3.03

21. Find the first quartile

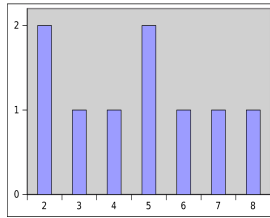   a) 2.0   b) 2.5   c) 3.0   d) 3.5   e) 4.0

22. Find the third quartile

    a) 5.0   b) 5.5   c) 6.0   d) 6.5   e) 7.0
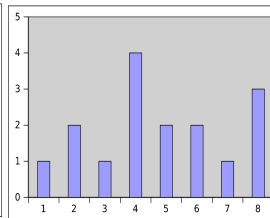
23. Which of the following bar graphs correctly illustrates the data?
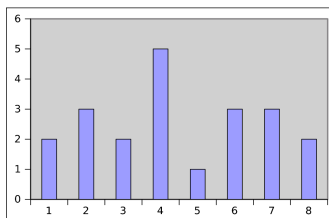

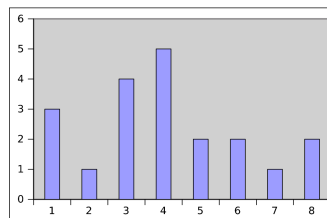a)   b)   c)

d)   e)

24. For the set of data $\{1, 1, 1, 3, 5, 7, 7, 10, 11, 13, 13, 15, 1072\}$, which of the following would be the best measure of central tendency?

    a) Mean   b) Median   c) Mode   d) Range   e) Standard Deviation

25. A very small standard deviation indicates the data is

    a) Very compressed, with most scores close to the mean   b) Widely dispersed, with many scores far from the mean   c) Skewed strongly to the left   d) Skewed strongly to the right   e) Approximately normal

26. The number one problem with doing an email survey is

    a) identity verification   b) getting email addresses   c) poor response rate   d) tabulating results   e) spam filters

27. In 1936 the Literary Digest predicted which of the following would win the presidential election?

    a) Franklin Roosevelt   b) Alf Landon   c) Herbert Hoover   d) Huey P. Long   e) John L. Rockefeller

28. Which of the following is cause for doubting the reliabilty of a survey?

    a) a self-selected sample   b) anecdotal evidence   c) leading questions   d) small sample size   e) any of these