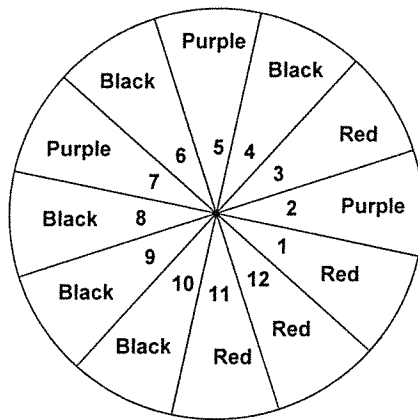1. You will spin the spinner once. Find each probability as a fraction.

a) P(# less than 6 or Red)   b) P(Purple or Red)

c) P(Black and even)   d) P(Multiple of 4 and odd)

e) P(Red or Prime)   f) P(factor of 24 | black)

2. Use the results of the survey shown below of their favorite Food. You will select one person at random. Find each probability as a fraction.

	Pasta	Chicken	Steak	Vegetables	Total
Female	18	23	8	14	63
Male	21	14	16	13	64
Totals	39	37	24	27	127

a) P(Female and Chicken)   b) P(Male or Pasta)   c) P(Pasta or Steak)

d) P(Vegetables and Pasta)   e) P(Female | Steak)   f) P(Vegetables | Male)

3. You take into the dressing room 4 pairs of blue jeans, 6 pairs of black pants, and 5 pairs of grey pants. You randomly select a pair of pants and try them on. You set the first pair aside to purchase and randomly grab another pair of pants to try on, etc. Find each probability as a fraction.
a) P(Black pants and Grey pants)   b) P(Blue Jeans and Grey pants and Blue Jeans)

4. In you pantry at home there are 12 cans of beans, 8 cans of corn, and 10 cans of beets. You take one can at random, don't like what you got and return it to the shelf then you take another can at random. Find each probability as a fraction.
a) P(Corn and Beans)   b) P(Beets and Beets)

5. You are going to buy a car and have to decide which one. You have narrowed your choice to 4 different colors, 3 different kinds of engines, and 7 different accessory packages.
a) If you can only choose one of each how many different cars could you order?
b) Find the different number of cars you could order if you can choose only one color, one engine, but 3 different accessory packages.

6. You have 8 different pictures you want to put up on your wall.
a) How many different ways could you arrange all 8 of the pictures on the wall?
b) If you only have room to hang 5 of them how many different ways could you arrange them on the wall?

7. There are 9 different fruits to choose from to create your own smoothie.
a) How many different smoothies could you make if you want only 4 different fruits?
b) You want to try all nine fruits. How many different smoothies could be made if you choose all 9 fruits?

8. Your PIN for your new credit card has 5 numbers and 3 letters. How many different serial numbers are possible if:
a) Letters and numbers can repeat?
b) Letters can't repeat and you can't use the letter 'O' but numbers can repeat.

9. Use this set of numbers: $18, 43, 16, 19, 20, 16, 32, 44, 19, 23, 24, 33, 37, 40$
a) Find the mean   b) Find the mode   c) Find the median
d) Find the range   e) Find the standard deviation.

10. Use this set of numbers: $112, 118, 110, 109, 112, 107, 140, 115, 120$
a) Find the standard deviation
b) Does the data from Prob 9 or 10 have more variation? Give a reason.

11. Two classes at a school have the following statistics:
1st Hour: Min: 32   Lower Quartile: 40
Median: 48   Upper Quartile: 72   Max: 80
2nd Hour: Min: 20   Lower Quartile: 48
Median: 72   Upper Quartile: 80   Max: 83

Draw a box-and-whisker plot for each class using the same number line then answer the following questions.
a) If your score in 1st hour was 72 then you did better than what percent of the others in 1st hour? What percent of 2nd hour did better than you?
b) If your score was 41 did you do better compared to the rest of the class in 1st or 2nd hour? Give a reason.
c) If your score was 72 what percent of 1st hour did better than you? What percent of 2nd hour socred lower than you?

12. Use this set of data: $16, 22, 23, 24, 26, 27, 33, 34, 39, 45, 47, 50, 60, 71, 75$
a) What number is at the 20% percentile?
b) What number is at the 80% percentile?
c) 45 is at what percentile?

13. A quality control employee samples some cans of vegetables coming off the production line. The mean weight of the cans is 24.5 ounces with a standard deviation of 1.5 ounces.
a) What is the z-score for a can that weighs 17 ounces? What does this z-score mean?
b) What is the z-score of a can that weighs 29 ounces?
c) What percent of the cans weighed less than 23 ounces?
d) What percent of the cans weighed between 21.5 and 29 ounces?
e) What interval of weights contains 68% of the cans?
f) If the z-score of a can is 1.6 find the weight of the can to the nearest tenth of an ounce.
g) What is the probability of grabbing a can at random and the can weighs less than 26 ounces?

14. A survey of 350 people in a city indicates that 275 are worried about the economy.
a) Find the sample proportion to the nearest whole percent.
b) Find the margin of error to the nearest whole percent.
c) Find the interval that is most likely to contain the actual percent of the population that is worried about the economy.
d) If there are 820,000 people in the city. Find the interval in numbers of people that most likely contains the actual amount of people who are worried about the economy.

15. A sample of ice cream bars coming off of the production line indicates that 8% of the boxes are damaged. If the sample had a margin of error of ±5% find the sample size to the nearest whole number.

16. The soccer team has one more game in the regular season. The probability that the goalie has a shutout is $\frac{2}{5}$. The probability that the goalie gives up 3 or more goals is $\frac{1}{8}$. Find the following probability as a fraction.
P(shutout or 3+ goals)

17. You are going to your grandmothers for dinner. The probability that you ride with your sister is $\frac{3}{7}$. The probability that you ride with your parents is $\frac{5}{12}$. Find the following probability as a percent rounded to the nearest tenth.
P(ride with sister or ride with parents)

18. A school committee is being formed. There will be 10 people on the committee. It has been decided to have 5 adults and 5 students on the committee. There are 12 adults and 13 students that want to be on the committee. Names will be chosen at random. How many ways can the committee be formed?

19. A debate team if being formed for a competition. There are 6 girls and 5 boys that want to be on the team. A team consists of 3 people. How many ways can a team of 3 boys or a team of 3 girls be formed if the names are picked at random?

20. Use this Venn Diagram that shows what movies people have seen recently. One person will be selected at random. Find each probability as a fraction.
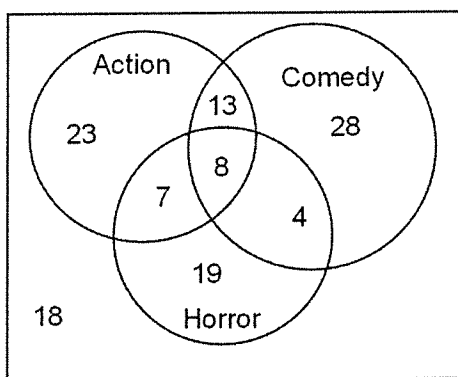

a) P(Action or Comedy)   b) P(Horror but not Action)

c) P(Comedy and Horror)   d) P(Not Action)   e) P(neither Comedy or Horror)

f) P(Action and Comedy and Horror)   g) P(Comedy | Action)

21. A homeowner is painting their living room. They have to paint the walls, ceiling, and trim each a different color. The paint store has 12 colors of wall paint, 8 colors of ceiling paint, and 6 colors of trim paint. How many different ways can the homeowner paint their living room?

22. At a qualifying race the fastest 8 cyclists move on to the finals. If there are 15 cyclists in the qualifying race home many ways can the 8 cyclists for the finals be selected?

23. Use the same situation as problem #22. Once the 8 finalists are determined their lane assignments for the final race is determined by a random drawing. How many different lane assignments are possible for the finals?

24. A student needs to fill their schedule with 6 classes, 1st hour through 6th hour. They have 9 classes to choose from. How many different schedules can be created?

25. In a large pool of candidates for a job there are 55% men . Ten candidates are randomly selected for an interview. Find each probability as a percent to the nearest hundredth.
a) P(exactly 6 are women)   b) P(at least 8 are men)   c) P(no more than 2 are women).

26. For each of the following find the probability that a point picked at random is in the shaded region. Give answer as a percent to the nearest tenth.

a) ABCD is a rectangle.

b) CDEF is a rectangle and pts D, E, and F are midpoints. $AB = 40$.
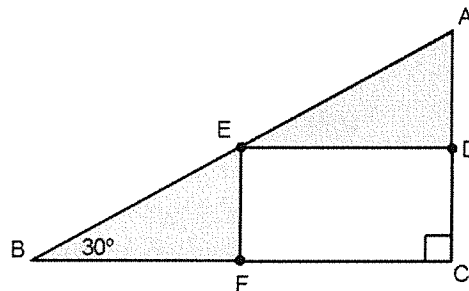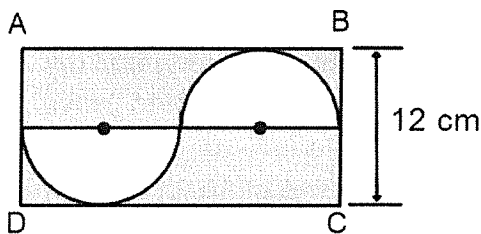
27. The diameter of the bulls-eye is 8in. The width of each ring is 3in. Find the probability a dart that randomly lands on the target lands in the 5 pt ring. Give the answer as a percent to the nearest hundredth.

4
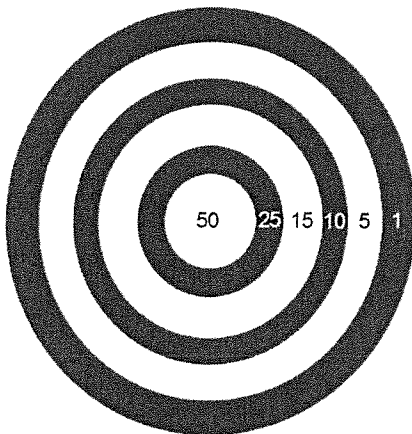
ANSWERS

1. a) $\frac{7}{12}$ b) $\frac{7}{12}$ c) $\frac{4}{12}$ d) $\frac{0}{12}$ e) $\frac{7}{12}$ f) $\frac{3}{5}$

2. a) $\frac{23}{127}$ b) $\frac{82}{127}$ c) $\frac{63}{127}$ d) $\frac{0}{127}$ e) $\frac{8}{24}$ f) $\frac{13}{64}$

3. a) $\frac{30}{210}$ b) $\frac{60}{2730}$ 4. a) $\frac{96}{900}$ b) $\frac{100}{900}$

5. a) 84   b) 420   6. a) 40,320   b) 6720

7. a) 126   b) 1   8. a) $1,757,600,000$ b) $1,380,000,000$

9. a) 27.43   b) 16 and 19   c) 23.5   d) 28   e) 9.99

10. a) $\sigma = 9.4$ b). Due to the larger standard deviation the set of numbers in problem 9 has more variation.

11. a) 72 is better than 75% of 1st hour but 50% of 2nd hour did better.
b) If you had a 41 you did better in 1st hour because over 25% of 1st hour scored lower whereas less than 25% of 2nd hour scored lower.
c) 25% of 1st hour scored better than 72 and 50% of 2nd hour scored lower.

12. a) 24 is at the 20th percentile   b) 60 is at the 80th percentile.
c) 45 is at the 60th percentile.

13. a) $z - score = -5$ which means 17 ounces is five standard deviations below the mean.
b) $z - score = +3$ c) 16%   d) 97.5%   e) 23 to 26 ounces.
f) 26.9 ounces   g) 84% probability.

14. a) 79%   b) $\pm5\%$ c) 74% to 84%   d) 606,800 to 688,800 people

15. Sample size is about 400.   16. $\frac{21}{40}$ 17. 66.7%

18. $1,019,304$ 19. 30

20. a) $\frac{83}{120}$ b) $\frac{23}{120}$ c) $\frac{12}{120}$ d) $\frac{69}{120}$ e) $\frac{41}{120}$ f) $\frac{8}{120}$ g) $\frac{21}{51}$

21. 576   22. 6435   23. 40,320   24. 60,480

25. a) 15.96%   b) 9.95%   c) 9.95%

26. a) 60.7%   b) 50%

27. 24.10%