All work must be shown, and numbers explained. Attach this cover sheet to your work.

1. A single card is drawn from a deck. Find these probabilities.
   a) What is the probability that the card will be a heart and a Jack?
   b) What is the probability that the card will be a heart or a Jack?
   c) Given that the card is a heart, what is the probability that it will be a Jack?
   d) Given that the card is a Jack, what is the probability that it will be a heart?

2. At The Pap, t-shirts are on sale. 12 shoppers bought azure, 8 bought black, 4 bought cyan, and 7 bought drab. At Silt 'n' Straw the same shoppers ate 13 peach, some ate quince, and 10 raspberry ice-creams. 3 shoppers who bought azure t-shirts ate peach and 1 ate quince ice-cream. One of the shoppers that ate quince ice-cream bought a drab t-shirt. Of the shoppers that ate raspberry none bought black and 2 bought cyan t-shirts. No peach ice-cream eaters bought cyan t-shirts.
If one of these shoppers is selected at random find the probability that the shopper bought
   a) A black t-shirt.
   b) A quince eater bought cyan or drab t-shirt
   c) An azure wearer did not eat raspberry.
   d) Ate Quince ice-cream.

3. An automobile sales woman finds that the probability of making a sale is 0.23. If she talks to four people today what is the probability that she will sell four cars.

4. In a class of 12 men and 18 women, two students are selected at random to give an unrehearsed speech. Find these probabilities
   a) Both speeches are given by women.
   b) Both speeches are given are men.
   c) One speech is given by a woman and one by a man.
   d) At least one speech is given by a woman.

5. 83.9% of drivers are insured and of those: 60% are classified as low-risk and 1% of those have accidents; 30% are medium-risk and 5% of those have accidents; and 10% are high-risk and 9% of those have accidents. 14% of uninsured driver have accidents. If a driver is selected at random, find the probability the driver will have had an accident during the year.

6. There is a 0.39 probability that Kirk will buy a new car, a 0.73 probability that Rachel will buy a new car, and a 0.28 probability that they both will purchase a new car. Find the probability that neither will purchase a new car.

7. An adventure-cruise director schedules four different scuba-dives, two kayak tours, five deck games, and three ice-climbs for a six day Alaska cruise. If you and your partner select four activities at random find these probabilities.
   a) Two scuba-dives, one deck game, and one ice-climb.
   b) One of each activity.
   c) At least one kayak tour.

8. An ancient camel bone die was unearthed at an archaeological site. It was analyzed and found to have these probabilities:

Face, x	1	2	3	4	5	6
P(x)	0.1	0.1	0.18	0.18	0.22	0.22

In three throws of this die find these probabilities.
   a) Three sixes.
   b) Exactly one 3 and exactly one 2.
   c) At least one six.

9. Use this 1998 Census Data to find the probabilities.
(Table in millions, and ≥ 18 years of age)

	Male	Female
Never Married	25.5	21.0
Married	58.6	59.3
Widowed	2.6	11.0
Divorced	8.3	11.1

   a) P(female or divorced)
   b) P(female and never married)
   c) P(male given they've never married)
   d) P(never married given that they're male)

10. For fun on Saturday night, you and a friend are going to toss a fair coin 10 times. Let H be the event that a toss lands with heads showing, and let T be the event that a toss lands with tails showing. Because the coin is fair, assume P(H) = P(T) = 0.5. Neither of you know how to flip the coin to obtain some desired outcome.
You flip   HTHHTHTTTH. ☐Your friend flips HHHHHHHTTT.
a) Which sequence is more likely to occur? Explain your answer!
b) What is the probability that you will get at least one head in ten tosses?

11. Blood comes in four types: O, A, B, and AB. The percentages of people in the United States with each blood type are: Type O 46%, type A 40%, type B 10%, type AB 4%.
a)   What is the probability that two people getting married both have blood type O?
b)   What is the probability that two people getting married both have the same blood type?

12. Two cards are dealt from a deck, without replacement. Find the probability you will be dealt:
   a) Exactly one 4 and exactly one diamond.
   b) Two jacks, one of them being the jack of spades.
   c) The jack of spades followed by the queen of hearts.
   d) Two cards in sequence.
e.g. An ace followed by a 2, or a 2 followed by a 3, etc. up to a K followed by an ace.