Math 172 Review for Exam 3 (Ch. 11 Probability)

1. Explain the difference between experimental probability and theoretical probability. Is the experimental probability and theoretical probability of an event always equal?

2. A certain jukebox contains only three records: Blue Moon, Blue Suede Shoes, and Blue Monday. If the probability theat Blue Moon is playing is 1/6, and the probability that Blue Sued Shoes is playing is 1/3, what is the probability that Blue Monday is playing?

3. How many elements are in the sample space of the experiment "toss a die and select a digit (0, 1, 2, 3, 4, 5, 6, 7, 8, 9)?"

4. Write out Pascal's triangle, up to and including the row beginning 1 6.

5. In tossing 6 fair coins, find the probability of getting 3 heads and 3 tails (in any order.)

6. On a 6 item true/false test, find the probability that a student answers any 3 correctly (assuming that the student is randomly guessing.)

7. In a family with 6 children, find the probability that there are 3 boys and 3 girls.

A bag contains 2 red balls, 3 blue balls and 1 yellow ball.

8. What is the probability of drawing 1 red ball?
9. How many red balls must be added to the bag so that the probability of drawing a red ball is ½?
10. How many blue balls must be added to the original bag so that the probability of drawing a red ball is 1/5?

There are 3 red, 4 white and 5 blue tickets in a box. Tickets are drawn from the box and not replaced. There will be two tickets selected.

11. Draw the probability tree for this.
12. Using the tree, find the probability that the first ticket is red and the second is blue.
13. Using the tree, find the probability that the first ticket is not blue.
14. Using the tree, find the probability that the second ticket is orange.

If you draw a whole number from 1 to 10 at random, what are the ODDS

15. in favor of getting a 7?
16. against getting a prime?
17. against getting a number less than 9?

18. Suppose $P(A) = \frac{3}{10}$. What are the odds in favor of A?

19. A 12 sided die having the faces numbered 1 to 12 is tossed once and the number on the top face is recorded. Let A be the event that the number is not prime, and let B be the event that the number is odd. Find $P(A|B)$ and $P(B|A)$

20. At Nelson Elementary, all students and faculty are given id numbers consisting of two letters followed by five digits, with no repeating letters or digits. How many different ID numbers are possible? What is the probability that Jill Sweet gets an ID card with her initials on it? (Assuming that the ID numbers are generated randomly.)

The game of bridge is very popular. A bridge hand consists of 13 cards from a standard 52 card deck.

21. How many brige hands are possible?
22. What is the probability that a bridge hand contains all 13 diamonds?
23. What is the probability that a bridge hand contains 4 hearts, 2 diamonds, 3 spades and 4 clubs?

A student is chosen at random from the list of all students enrolled in the college. The student is interviewed. Let A be the event that the student is enrolled in a 10 AM class. Let B be the event that the student regularly eats breakfast.

24. Explain (in words) what is meant by the following symbols: $P(A \cap B)$, $P(A|B)$, $P(\overline{B})$

25. If $P(A) = \frac{3}{7}$ and $P(B) = \frac{3}{4}$ and $P(A \cap B) = \frac{1}{5}$, find $P(A|B)$, $P(A \cup B)$ and $P(\overline{B})$

26. The Pokemon Cubone has an attack Bonemerang that says Flip 2 coins. This attack does 10 damage times the number of heads. Find the expected value of the attack.

A company would like to find out how the number of defective items produced varies between the day, evening and night shifts. The following table shows the results of a sample of items taken from each shift.

	Day	Evening	Night
Defective	24	28	47
Not Defective	279	224	165

27. If an item is picked at random, find the probability that the item is defective, given that it came from the night shift.
28. If an item is picked at random, find the probability that the item is came from the day shift, given that it is defective.
29. If an item is picked at random, find the probability that the item is defective, given that it came from the day shift.
30. Write a probability word problem where the answer is found by adding 0.2 and 0.15.

31. Write a probability word problem where the answer is found by multiplying $\frac{1}{5}$ and $\frac{3}{7}$.

The Gardening Club decides to do a lottery fundraiser to raise money to improve the landscaping in front of their school. There are 50 prizes of $10, 10 prizes of $15, 5 prizes of $30, and 1 prize of $50. Suppose that 1000 tickets are sold.

32. What is a fair price to pay for one ticket?
33. What should the price of one ticket be if, on average, people lose $0.50 per ticket?
34. If all 1000 tickets are sold, what can the lottery expect to gain if a ticket costs $2.00?