



1. A factory makes iPads. Over a long period, 3% of them are found to be faulty. A random sample of 40 iPads is tested.

a. Find the probability that five iPads are faulty.

b. Find the probability that at most one iPad is faulty.

2. You work at a T-shirt printing business. Of 15 T-shirts shipped, 5 are printed improperly. If you randomly chose three T-shirts out of the shipment, what is the chance that

a. all T-shirts are printed correctly?

b. at least two T-shirts are printed correctly?

3. How many different 7- digit phone numbers can be created if the second digit can't be a five or a two, there is no zero in the number and the last digit must be a three.

4. Find the number of distinguishable permutations of the letters in RHEE.

5. How many different 5 person batting lineups are possible from a team of 12?

6. Two dice are rolled. What is the probability that the:

	1	2	3	4	5	6
1						
2						
3						
4						
5						
6						

a) sum is even or a number less than 7?

b) sum is even and a number less than 7?

c) sum is 5 given that one die is a 2?

7. Professor Halen has 184 students in his college mathematics lecture class. The scores on the midterm exam are normally distributed with a mean of 72.3 and a standard deviation of 8.9. How many students in the class can be expected to receive a score between 82 and 90?

8. A machine is used to fill soda bottles. The amount of soda dispensed into each bottle varies slightly. Suppose the amount of soda dispensed into the bottles is normally distributed. If at least 99% of the bottles must have between 585 and 595 milliliters of soda, find the greatest standard deviation, to the nearest hundredth, that can be allowed.

9. Sketch a relative frequency distribution using a bin width of 4 and a minimum score of 10.

11 18 15 13 19 21 13 20 18 20

Would a normal curve be a good model for this distribution? Why or why not?

10. Simplify

a)  $(7x^8y^{-5})^{-2}(3x^3y^{-2})^2$

b)  $\left(\frac{1}{8}\right)^{\frac{2}{3}}$

11. Sketch

a)  $y = 2^{x-3} - 5$

b)  $y = -(x+4)^3 - 3$

c)  $y = -\sqrt{x+2} + 6$

12. A store produces pants and sports jackets. Each pair of pants needs  $1 m^2$  of cotton and  $2 m^2$  of polyester. Every jacket needs  $1.5 m^2$  of cotton and  $1 m^2$  of polyester. The store has  $750 m^2$  of cotton and  $1000 m^2$  of polyester available. The profit is \$50 for each pair of pants and \$40 for each jacket. Write the constraints needed to maximize the store's profits.

13. Factor

a)  $2x^7 - 8x^3$

b)  $6x^3 + 13x^2 - 5x$

14. Solve  $3(\sqrt{2x+1})^2 - 19(\sqrt{2x+1}) - 14 = 0$

15. A test has five questions. To pass the test, at least three of the questions must be answered correctly. The probability that Mark answers a question correctly is  $\frac{3}{5}$ .

Let X be the number of questions that Mark answers correctly.

a) Find  $E(X)$

b) Find the probability that Mark passes the test.

16. A bag of marbles contains 4 blue and 2 green marbles. Two marbles are chosen without replacement.

a) Draw a tree diagram including the probabilities.

b) Create a probability distribution chart for the number of green marbles chosen.

c) You get \$8 when you get the at least one green marble, but must pay \$6 when you get both blue marbles. Find the expected value.

d) Is the "game" fair?