1. (a) $C(12,4)C(10,1) + C(7,4)C(15,1)$
   (b) $C(7,3)C(15,2) + C(7,2)C(15,3)$
   (c) $C(22,5) - [C(12,0)C(10,5) + C(12,1)C(10,4)]$

2. $\frac{13!}{5!3!4!}$
   or $C(13,5)C(8,3)C(5,4)C(1,1)$

3. (a) $C(12,4)C(7,3) * 7!$
   the two combinations pick the people for the picture. the 7! puts them in the row.

   or $P(12,4)P(7,3) * C(7,4)$
   the combination shuffles the guys
   (b) $\frac{12*7*11*6*10*5*9 + 7*12*6*11*5*10*4}{P(19,7)}$

4. This is not binomial since the problem says that the only the first four customers pay with a credit card. This problem is looking at a single branch of the tree.
   $(0.26)^4(0.74)^5$

5. Answer will vary.
   Let X be the number of freeshots made out of 100 attempts

6. n=80, p=0.3
   r = 0, 1, 2, ..., 27
   binomcdf(80,0.3,27) = 0.80464

7. Median= 5
   Mean=3.75
   Mode= 0 and 5
   sample standard deviation = 3.1112
   population standard deviation=3.07205
   population variance = 9.43749

8. use Chebyshev's inequality
   solve for k:
   $108 = 75 + k * 15$
   $33 = 15k$
   $k = 2.2$
   $P(42 \le X \le 108) \ge 1 - \frac{1}{2.2^2} = 0.7934$

9. (a) normalcdf(8,1E99,10,3) = 0.7475
   (b) 0
   (c) normalcdf(7,12,10,3) = 0.5889
   (d) n= 200, p = 0.5889,
   r = 44, 45, ..., 57

   binomcdf(200,0.5889,57) - binomcdf(200,0.5889,43)

Check the back of the page for more problems.

10. $\mu - 2.1\sigma < x < \mu + 2.1\sigma$
    $78.5 < x < 141.5$

11. (a) X = 1, 2, 3, ..., 11
    (b) $\frac{10}{18} * \frac{8}{17}$

12. inverse norm needs the area to the left of the cutoff.
    invnorm(0.88,15, 2.3) = 17.702469 minutes

13. (a) Draw a tree to get the probabilities.

x	-1	2	3	4
prob	$\frac{1}{12} + \frac{1}{2} = \frac{7}{12}$	$\frac{1}{12}$	$\frac{1}{4}$	$\frac{1}{12}$

    (b) 0.666666
    (c) $0.666666 * 10,000 = 6666.66$

    profit of $6,666.66

Check the back of the page for more problems.