1. (a) $C(9,5)C(14,1) + C(10,5)C(13,1)$
   (b) $C(9,4)C(14,2) + C(4,2)C(19,4) - C(9,4)C(4,2)$
   (c) $C(23,6) - [C(9,0)C(14,6) + C(9,1)C(14,5)]$

2. $\dfrac{17!}{8!2!6!}$
   or $C(17,8)C(9,2)C(7,6)C(1,1)$

3. (a) $C(8,3)C(10,4) * 7!$
   the two combinations pick the people for the picture. the 7! puts them in the row.

   or $P(8,3)P(10,4) * C(7,3)$
   The combination shuffles the location of the boys.
   (b) $\dfrac{8*10*7*9*6*8*5 + 10*8*9*7*8*6*5}{P(18,7)}$

4. This is not binomial since the problem says that the only the first three customers pay with a credit card. This problem is looking at a single branch of the tree.

   $(0.18)^3(0.82)^4$

5. Answer will vary.
   Let X be the distance that a baseball can be hit.

6. n=40, p=0.12
   r = 0, 1, 2, ..., 7
   binomcdf(40,0.12,7) = 0.90037

7. mode = 3, 10
   Median= 8.5
   Mean = 7.6
   population standard deviation= 3.9038
   sample standard deviation = 3.9536
   population variance = 15.23965

8. use Chebyshev's inequality
   solve for k:
   $292 = 220 + k * 45$
   $72 = 45k$
   $k = 1.6$
   $P(148 \le X \le 292) \ge 1 - \dfrac{1}{1.6^2} = 0.609375$

9. (a) normalcdf(19,1E99,16,8) = 0.3538
   (b) 0
   (c) normalcdf(12,21,16,8) = 0.4255
   (d) n= 300, p = 0.4255,
   r = 111, 112, ..., 130

   binomcdf(300,0.4255,130) - binomcdf(300,0.4255,110)

Check the back of the page for more problems.

10. $\mu - 1.4\sigma < x < \mu + 1.4\sigma$
    $48.8 < x < 71.2$

11. (a) x = 1, 2, 3, ..., 16
    (b) $\frac{15}{30} * \frac{15}{29}$

12. inverse norm needs the area to the left of the cutoff.
    invnorm(0.82,14, 1.6) = 15.4646 minutes

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

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

    (b) -0.83333
    (c) $-0.83333 * 10,000 = -833.33$

    loss of $833.33

Check the back of the page for more problems.