1) $P(X=3) = \frac{\binom{8}{3}\binom{12}{4}}{\binom{20}{7}} = \frac{(56)(495)}{77520} = 0.3576$

2) a) $P(X=2) = \frac{\binom{4}{0}\binom{26}{10}}{\binom{30}{10}} = 0.3120$

b) $P(X=0) = \frac{\binom{4}{0}\binom{26}{10}}{\binom{30}{10}} = 0.1768$

3) $P(X=12) = 0.1(0.9)^{11} = 0.0314$

4) a) $P(X=3) = (0.4)(0.6)^2 = 0.144$

b) $P(X \leq 3) = 0.4(0.6)^0 + 0.4(0.6)^1 + 0.4(0.6)^2$
$= 0.784$

c) $\mu_X = 1/p \quad 1/0.4 = 2.5$

d) $1-p/p^2 \quad \frac{1-0.4}{(0.4)^2} = 3.75$

5) a) $\binom{6}{2}(0.4)^3(0.6)^4 = 0.12441$

b) $\frac{3}{0.4} = 7.5$

c) $3\left(\frac{1-0.41}{(0.41)^2}\right) = 11.25$

6) $\frac{16!}{4!\,1!\,5!}(0.5)^4(0.1)^1(0.4)^5 = 0.0806$

9) a) $(0.8)(0.2)^0 + (0.8)(0.2)^1 + (0.8)(0.2)^2 = 0.992$

b) $\frac{(0.8)(0.2)^2}{1-(0.8)(0.2)^0-(0.8)(0.2)^1} = 0.80$

c) $\frac{1}{0.8} = 1.25$

10) a) $\frac{5}{0.001} = 5000$

b) $\sqrt{\frac{5(1-0.001)}{(0.001)^2}} = 2234.95$

11) a) $\binom{3}{2}\binom{7}{2} / \binom{10}{4} = \frac{(3)(21)}{210} = 0.30$

b) $\frac{(4)(3)}{10} = 1.2$

c) $\sqrt{4\left(\frac{3}{10}\right)\left(1-\frac{3}{10}\right)\left(\frac{10-4}{10-1}\right)} = 0.748$

13) a) $1 - \frac{\binom{5}{0}\binom{55}{10}}{\binom{60}{10}} - \frac{\binom{5}{1}\binom{55}{9}}{\binom{60}{10}} = 0.1904$

b) $1 - \frac{\binom{10}{0}\binom{50}{10}}{\binom{60}{10}} - \frac{\binom{10}{1}\binom{50}{9}}{\binom{60}{10}} = 0.5314$

c) $1 - \frac{\binom{20}{0}\binom{40}{10}}{\binom{60}{10}} - \frac{\binom{20}{1}\binom{40}{9}}{\binom{60}{10}} = 0.9162$

15) a) $\frac{20!}{5!7!8!}(0.25)^5 * (0.35)^7 * (0.40)^8 = 0.0411$

b) $1 - 0.9725 = 0.1275$

$1 - \text{Bwm}\left(\binom{20}{x}(0.40)^x(1-0.40)^{20-x}\right) =$