1) $X \sim Binom(100, 0.8)$, X: the number of perfect items

2) $0.8 * (0.2)^4 = 0.00128$

3) $\overset{np}{E(X)} = 80$, $\overset{npq}{Var(X)} = 16$

4) $X \sim Binom(15, 0.4)$ X: the patient recovers

5) $f(X=5) = \binom{15}{5} (0.4)^5 (0.6)^{10}$

6) $E(X) = np = 15 * 0.4 = 6$
$Var(X) = npq = 15 * 0.4 * 0.6 = 3.6$

7) $X \sim Bernoulli(1, \frac{3}{4})$, X: surviving a shock
$f(x) = (\frac{3}{4})^x (\frac{1}{4})^{1-x}$

8) $X \sim Poisson(\overset{\lambda}{4})$ X: number of radioactive particles passing throug a counte
$f(x) = \frac{e^{-4} 4^x}{x!}$

9) $f(x) = P(X=2) = \frac{e^{-4} 4^2}{2!}$

10) $E(X) = 4$, $Var(X) = 4$

11) $c = \frac{1}{4}$

12) 1.25

13) $c = 4$

14) $\frac{1}{16}$

15) $P(1 < z < 1.5) = 0.0919$

16) $P(-1 < z < 2) = 0.8186$

17) $P(z < -1.5) = 0.0668$

18) $X = 43.29$

19) $a = 1.53$

20) $a = -0.525$
Because $P(z < 0.525) = 0.7$
$= P(z > -0.525) = 0.7$
a = negative because the area 0.7 > 0.5 so it must be negative
we took average $\frac{0.52 + 0.53}{2}$

$b = 0.385$
average $\frac{0.38 + 0.39}{2}$
$P(z < 0.385) = P(z < -0.385)$