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MAT361.4

1) $n = 20$

$P_{die} = 1 - 75/100$

$= 0.25.$

(a) Bionomial distribution.

$P(x = x) = \binom{n}{x} p^{x} (1-p)^{n-x}$

$\therefore P(x=4) = \binom{20}{4} p^{4} (1-p)^{20-4}$

$= \binom{20}{4} 0.25^{4} \times 0.75^{16}$

$= 0.1897.$

(b) not more than 3 patients.

$P(x \leq 3) = P(x=0) + P(x=1) + P(x=2) + P(x=3)$

$= \binom{20}{0} \times 0.25^{0} \times 0.75^{20} + \binom{20}{1} \times 0.25^{1} \times 0.75^{19}$

$+ \binom{20}{2} \times 0.25^{2} \times 0.75^{18} + \binom{20}{3} \times 0.25^{3} \times 0.75^{17}$

$= 3.17 \times 10^{-3} + \cancel{0.0211} \overset{0.02114}{} + 0.067 + 0.1339$

$= \cancel{0.4151}\ 0.22521$

Answer

2) $X \sim N(0,1)$

$E(x) = \mu = 0$

$V(x) = \sigma^2 = 1.$

$\therefore \sigma = 1.$

Now, $P(X > -1)$

$= P(-1 < x < \infty)$

$= P\left(\frac{-1-\mu}{\sigma} < \frac{x-\mu}{\sigma} < \frac{\infty-\mu}{\sigma}\right)$

$= P\left(\frac{-1-0}{1} < z < \infty\right)$

$= F(\infty) - F(-1)$

$= 1 - F(-1)$

$= 1 - 0.1587$

$= 0.8413$ Answer

Figure