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39) $P(Z < 1.32) = \Phi(1.32) = 0.90658$

$P(Z < 3.0) = \Phi(3.0) = 0.99865$

$P(Z > 1.45) = 1 - \Phi(1.45) = 0.0735293$

$P(Z > -2.15) = 1 - \Phi(-2.15) = 1 - (1 - \Phi(2.15)) = 0.98422$

$P(-2.34 < Z < 1.76) = \Phi(1.76) - (1 - \Phi(2.34)) = 0.9511529$

40) $P(-1 < Z < 1) = \Phi(1) - (1 - \Phi(1)) = 0.6826894$

$P(-2 < Z < 2) = \Phi(2) - (1 - \Phi(2)) = 0.95449988$

$P(-3 < Z < 3) = \Phi(3) - (1 - \Phi(3)) = 0.99730006$

$P(Z > 3) = 1 - \Phi(3) = 0.00134997$

$P(0 < Z < 1) = \Phi(1) - \Phi(0) = 0.34134474$

41) $P(Z < z) = 0.9 = \Phi(z)$ $z = 1.28$

$P(Z < z) = 0.5 = \Phi(z)$ $z = 0$

$P(Z > z) = 0.1$ $\Phi(z) = 0.9$ $z = 1.28$

$P(Z > z) = 0.9$ $\Phi(z) = 0.1$ $z = -1.28$

$P(-1.24 < Z < z) = 0.8 = \Phi(z) - (1 - \Phi(1.24)) = 0.8$

$\Phi(z) = 0.90934862$

$z = 1.34$

42) $P(-z < Z < z) = 0.95 = 2\Phi(z) - 1 = 0.95$ $\Phi(z) = 0.975$

$z = 1.96$

$P(-z < Z < z) = 0.99 = 2\Phi(z) - 1 = 0.99$ $\Phi(z) = 0.995$ $z = 2.58$

$P(-z < Z < z) = 0.68 = 2\Phi(z) - 1 = 0.68$ $\Phi(z) = 0.84$ $z \sim 1$

$P(-z < Z < z) = 0.9973 = 2\Phi(z) - 1$ $\Phi(z) = 0.99865$ $z = 3$

43) $\mu = 10$ $\sigma = 2$

$P(X<13) = P(Z < \frac{13-10}{2}) = P(Z<1.5) = \Phi(1.5) = 0.93319277$

$P(X>9) = P(Z > \frac{9-10}{2}) = P(Z>-1.5) = 1-(1-\Phi(1.5)) = 0.93319277$

$P(6<X<14) = P(\frac{6-10}{2} < Z < \frac{14-10}{2}) = \Phi(2)-(1-\Phi(2)) = 0.95449988$

$P(2<X<4) = P(\frac{2-10}{2} < Z < \frac{4-10}{2}) = (1-\Phi(3))-(1-\Phi(4)) = 0.00131828$

$P(-2<X<8) = P(\frac{-2-10}{2} < Z < \frac{8-10}{2}) = (1-\Phi(1))-(1-\Phi(6)) \simeq 0.15865526$

49) $\mu = 0.5$ $\sigma = 0.05$

$P(X>0.62) = P(Z > \frac{0.62-0.5}{0.05}) = 1-\Phi(2.4) = 0.00819753$

$P(0.47<X<0.63) = P(\frac{0.47-0.5}{0.05} < Z < \frac{0.63-0.5}{0.05}) = \Phi(2.6)-(1-\Phi(0.6))$

$P(X<x) = 0.9 = P(Z < \frac{X-0.5}{0.05}) = \Phi(\frac{x-0.5}{0.05}) = 0.9 = 0.72075572$

$\frac{X-0.5}{0.05} = 1.28$ $X = 0.564$

59) $\mu = 0.002$ $\sigma = 0.0004$

$P(X>0.0026) = P(Z > \frac{0.0026-0.002}{0.0004}) = 1-\Phi(1.5) = 0.06680721$

$P(0.0014<X<0.0026) = P(\frac{0.0014-0.002}{0.0004} < Z < 1.5) = \Phi(1.5)-(1-\Phi(1.5))$

$= 0.86638554$

$P(0.0014<X<0.0026) = P(\frac{-0.0006}{\sigma} < Z < \frac{0.0006}{\sigma}) = 2\Phi(\frac{0.0006}{\sigma})-1 = 0.995$

$\Phi(\frac{0.0006}{\sigma}) = 0.9975$

$\frac{0.0006}{\sigma} = 2.8$

$\sigma = 0.00021428571$

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61) $n = 200$ $p = 0.4$ $q = 0.6$ $\text{mean} = np = 80$

$\sigma = \sqrt{npq} = 4\sqrt{3}$

$P(X \le 70) = P\left(Z \le \frac{70-80}{4\sqrt{3}}\right) = 1 - \Phi(1.44) = 0.074933574$

$P(70 \le X \le 90) = P\left(\frac{70-80}{4\sqrt{3}} \le Z \le \frac{90-80}{4\sqrt{3}}\right) = 2\Phi(1.44/1) = 0.850132\ldots$

63) $n = 1000$ $p = 0.02$ $q = 0.98$ $\text{mean} = np = 20$

$\sigma = \sqrt{npq} = 4.427$

$P(x > 25) = P\left(Z \ge \frac{25-20}{4.427}\right) = 1 - \Phi(1.13) = 0.129238816$

$P(20 < x < 30) = P(0 < Z < 2.26) = \Phi(2.26) - \Phi(0) = 0.488689619$

65) $n = 5000$ $p = 0.001$ $q = 0.999$ $np = 5$ ~~$\sigma = 5$~~ $\lambda = 5$

$P(x \ge 10) = P(Z \ge 2.01) = 1 - \Phi(2.01)$ $\sigma = \sqrt{npq} = 2.235$

$= 0.022216$

67) $n = 100$ $p = 0.05$ $q = 0.95$ $np = 5$

$\sigma = \sqrt{npq} = 2.179$

$P(X \ge 1) = P(Z \ge -1.84) = 1 - (1 - \Phi(1.84)) = 0.967\ldots$

69) $\lambda = 10000$ $\sigma = \sqrt{\lambda} = 100$

Let X binomial $n = 365$ $p = P(Y \ge 10200)$

$= P(Z \ge 2) = 1 - \Phi(2)$

$= 0.02275$

$E(X) = np = 8.3$ days

$P(X \ge 15) = P\left(Z > \frac{15 - 8.3}{2.85}\right) = 1 - \Phi(2.35) = 0.009386\ldots$

7) $\lambda = 0.4$ per page

a) because the error on a certain page has nothing to do with the events of error on other pages

b) $n = 1000$ $\quad p = P(Y \geq 1)$

$= 1 - P(Y = 0) = 1 - e^{-\lambda} = 1 - e^{-0.4} \simeq 0.33$

$E(x) = np = 330$

c) $P(x \geq 350) = P\left(Z \geq \frac{350 - 330}{14.87}\right) = 1 - \Phi(1.34) = 0.090122$