Normal distribution
Part 3
HW

Problem 5.3: 1a, 2bc, 7/8a

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5.3

1a) $P(X \geq 8)$ $X \sim B(10, .7)$, 1-binomcdf(10, .7, -∞, 7) = .3828

$\mu = np = 10(.7) = 7$ $\sigma = \sqrt{10(.7)(.3)}$, Approx = 1 - normcdf(-∞, 7.5, 7, $\sqrt{10(.7).3}$) = .3650

2b) $P(9 \leq x \leq 12)$ $X \sim B(21, .5)$, binomcdf(21, .5, -∞, 12) − binomcdf(21, .5, -∞, 9)

Approx = normcdf(-∞, 12.5, 21·.5, $\sqrt{21(.5)(.5)}$) − normcdf(-∞, 8.5, 21·.5, $\sqrt{21(.5)(.5)}$) = .6172 − .6166

c) $P(X \leq 3)$ $X \sim B(7, .2)$

Exact: binomcdf(7, .2, 0, 3) = .9667

Approx: normcdf(-∞, 3.5, 7·.2, $\sqrt{7 \cdot .2 \cdot .8}$) = .9764

7) $P(X \leq 200) \approx$ normcdf(-∞, 200.5, 250000·.0007, $\sqrt{250000 \cdot .0007 \cdot .9993}$) = .9731

8a) $P(X \geq 30) = 1 -$ normcdf(-∞, 30.5, 60·.25, $\sqrt{60 \cdot .25 \cdot .75}$) = .000002