Problem Set #9

15J

① $\mu = 100$
$\sigma = 20$

$X \sim N(100, 400)$

a) $P(X < 130)$

$z = \frac{130-100}{20} = 1.5$

$P(z < 1.5) \approx \boxed{.933 \text{ (3SF)}}$

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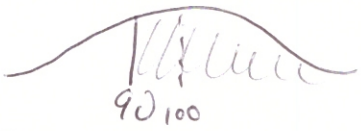
b) $P(X > 90)$



$z = \frac{90-100}{20} = -.5$

$P(z < -.5) \approx \boxed{.691 \text{ (3SF)}}$

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c) $P(80 < x < 125)$

$z = \frac{80-100}{20} = -1$

$z = \frac{125-100}{20} = 1.2$

$P(-1 < z < 1.2) \approx \boxed{.726 \text{ (3SF)}}$

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② $\mu = 4$
$\sigma = 0.25$

$X \sim N(4, .0625)$

$P(3.5 < x < 4.5)$

$z = \frac{3.5-4}{.25} = -2$

$z = \frac{4.5-4}{.25} = 2$

$P(-2 < z < 2) \approx .954$

$.954 (500)$
$\approx \boxed{477}$

15J cont...

③ $\mu = 14$
$\sigma = 4$
$X \sim N(14, 16)$

a) $P(X > 20)$

$Z = \frac{20-14}{4} = 1.5$

$P(Z > 1.5) \approx \boxed{.0668 \text{ (3sf)}}$

b) $P(X < 10)$

$Z = \frac{10-14}{4} = -1$

$P(Z < -1) \approx \boxed{.159 \text{ (3sf)}}$

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④ $\mu = 551.3$
$\sigma = 15$
$X \sim N(551.3, 225)$

$P(X > 550)$

$Z = \frac{550-551.3}{15} = -.1$

$P(Z > -.1) \approx \boxed{.540 \text{ (3sf)}}$

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⑤ $\mu = 500$
$\sigma = 20$
$X \sim N(500, 400)$

a) $P(X < 475)$

$Z = \frac{475-500}{20} = -1.25$

$P(Z < -1.25) \approx \boxed{.106 \text{ (3sf)}}$

b) $p = .106$
$n = 3$
$r = 3$

$\binom{n}{r}(p)^r(1-p)^{n-r}$

$= \binom{3}{3}(.106)^3(.894)^0$

$= \boxed{.00119 \text{ (3sf)}}$

* use answer to part a) and the binomial prob. formula *