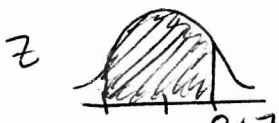
Solutions to HW #6, evens

6.20) X = diam. of Douglas fir
X is normal with $\mu = 4$ in. $\sigma = 1.5$ in.

a) $P(3 < X < 5) = P\left(\frac{3-4}{1.5} < Z < \frac{5-4}{1.5}\right)$



$= P(-0.67 < Z < 0.67)$
$= P(Z < 0.67) - P(Z < -0.67)$
$= .7486 - .2514 = 0.4972$

b) $P(X < 3) = P\left(Z < \frac{3-4}{1.5}\right) = P(Z < -0.67)$
$= 0.2514$

c) $P(X > 6) = P\left(Z > \frac{6-4}{1.5}\right)$
$= P(Z > 1.33)$
$= 1 - P(Z \leq 1.33)$
$= 1 - .9082$
$= 0.0918$

6.34) X = pulse rate randomly selected adult

a) $P(60 < X < 100) = P\left(\frac{60-\mu}{\sigma} < \frac{X-\mu}{\sigma} < \frac{100-\mu}{\sigma}\right)$

$= P\left(\frac{60-78}{12} < Z < \frac{100-78}{12}\right)$

$= P(-1.5 < Z < 1.83)$
$= P(Z < 1.83) - P(Z < -1.5)$
$= 0.9664 - 0.0668 = 0.8996$

b) 95th percentile of z-distribution
$P(Z \leq z_0) = 0.95$ look up 0.95 in Table 3 BODY
$z_0 = 1.65$
convert to scale of X:
$\frac{X-\mu}{\sigma} = 1.65 \Rightarrow \frac{X-78}{12} = 1.65$

6.34 b) (cont'd)

$$\frac{x-78}{12} = 1.65$$

$$x = 78 + 12(1.65)$$

$x = 97.8$ is the 95th percentile of pulse rates

c) $P(X > 110) = P\left(Z > \frac{110-78}{12}\right)$

$= P(Z > 2.67)$

$= 1 - P(Z \leq 2.67)$

$= 1 - .9962 = 0.0038$