Unit 5 – The Normal Distribution
Week #7 - Practice Problems
SOLUTIONS

Notes – (1) To obtain the pictures that you see below, I used the link
http://psych.colorado.edu/%7Emcclella/java/normal/accurateNormal.html
(2) Since I couldn't enter $-\infty$ or $+\infty$ I replaced these entries with -5 or +5 as extremes

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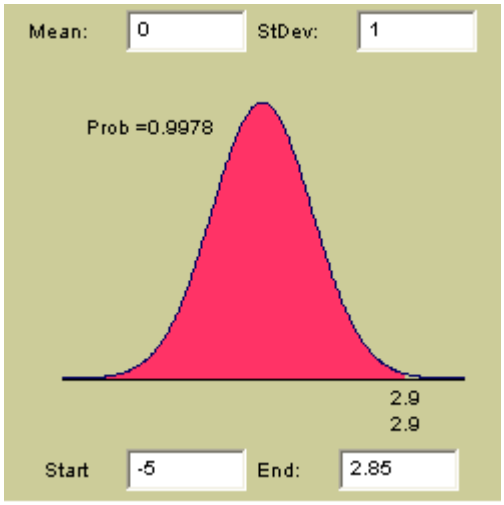
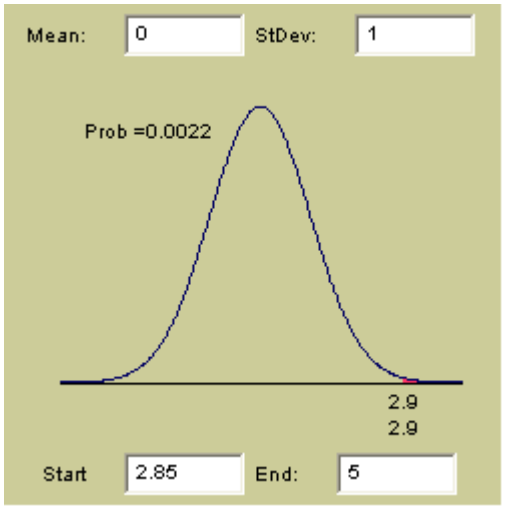
#1a.



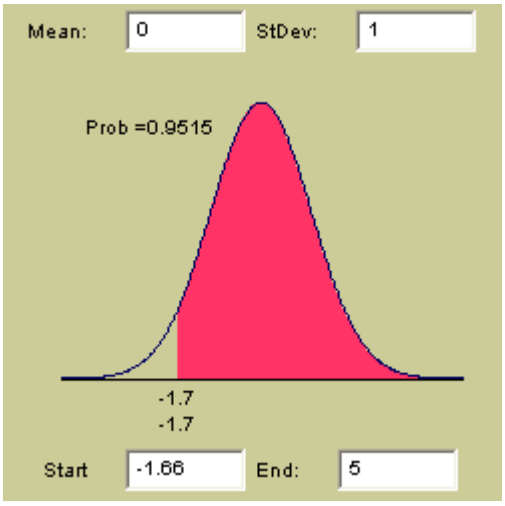
Pr (Z < 2.85) = .9978

#1b.



Pr (Z > 2.85) = .0022

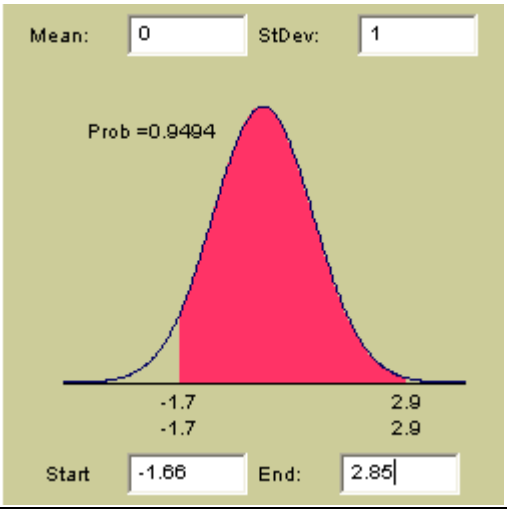
#1c.



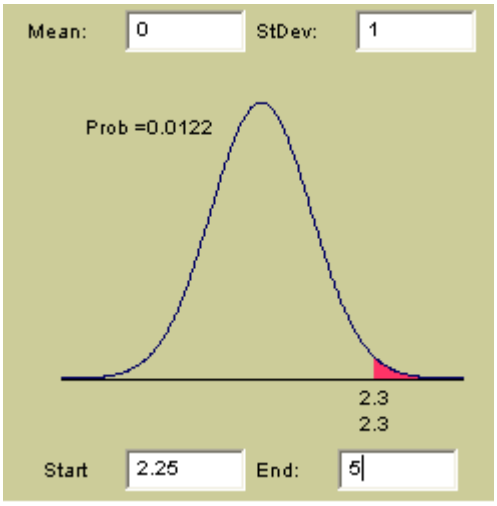
Pr (Z > -1.66) = Pr (Z < +1.66)
= .9515

#1d.

Pr (-1.66 < Z < 2.85)
= Pr (Z < 2.85) - Pr (Z < -1.66)
= Pr (Z < 2.85) - Pr (Z > +1.66)
= Pr (Z < 2.85) - { 1 – Pr (Z < 1.66) }
= Pr (Z < 2.85) – 1 + Pr (Z < 1.66)
= .9978 - 1 + .9515
= .9493 which is pretty close to the applet solution on the web

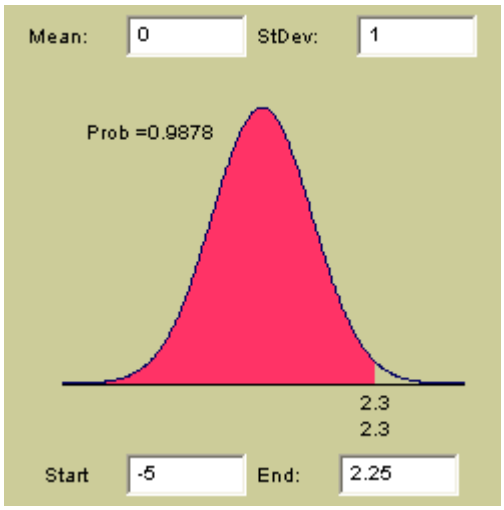


#1e.



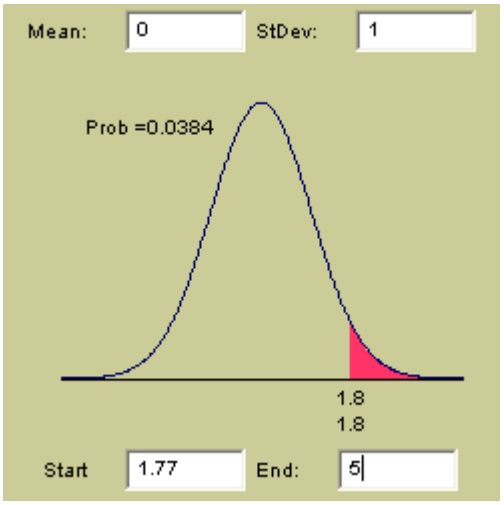
Pr (Z < -2.25)
= Pr (Z > + 2.25)
= .0122

#1f.



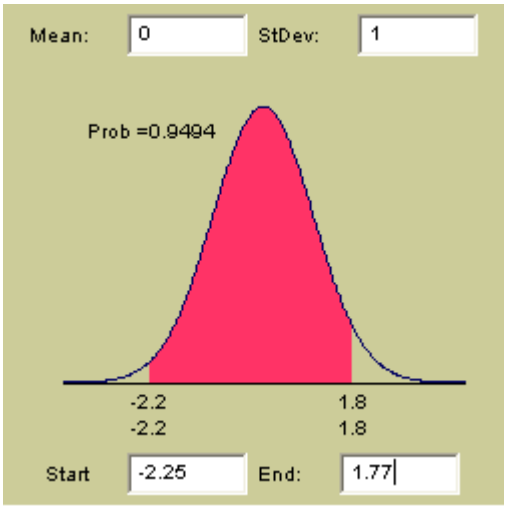
Pr (Z > -2.25)
= Pr (Z < +2.25)
= .9878

#1g.



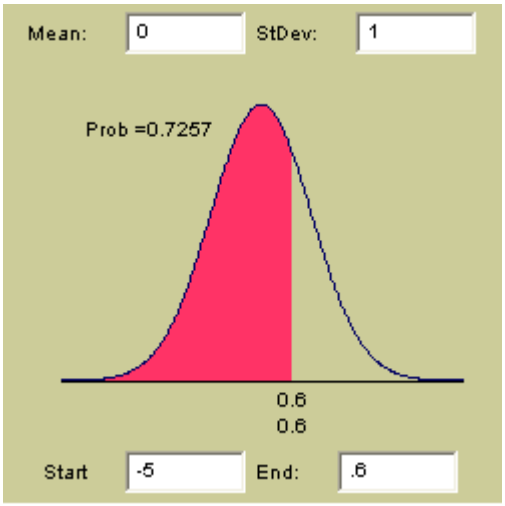
Pr (Z > 1.77)
= .0384

#1h.



Pr (-2.25 < Z < 1.77)
= Pr (Z < 1.77) - Pr (Z < -2.25)
= Pr (Z < 1.77) – Pr (Z > +2.25)
= .9616 - .0122
= .9494

#2a.



$$\text{pr}(X < 67) = \text{pr}\left[\left(\frac{X-\mu}{\sigma}\right) < \left(\frac{67-\mu}{\sigma}\right)\right]$$

$$= \text{pr}\left[Z < \left(\frac{67-65.5}{2.5}\right)\right]$$

$$= \text{pr}[Z < .6]$$

$$= .7257$$

#2b.

$$\text{pr}(64 < X < 67) = \text{pr}\left[\left(\frac{64-65.5}{2.5}\right) < Z < \left(\frac{67-65.5}{2.5}\right)\right]$$

$$= \text{pr}[-6 < Z < +.6]$$

$$= .4515$$
