**Solutions to Chapter 11.1 Exercises**

**Exercise 11.1**

See Detailed Solution to Chapter 5 Exercises\_1.xls for the claim probability distribution used to calculate the probability of a large claim.

Let X = number of large claims

$$n=100,000$$

$$p=0.00211$$

Since *p* is close to 0 we assume X ~ Bin(100,000, 0.00211), therefore

$E\left(X\right)=np=\left(100,000\right)×\left(0.00211\right)=211$

$σ\left(X\right)=\sqrt{np(1-p)}=\sqrt{\left(100,000\right)×(0.00211)×(1-0.00211)}=14.5$

$$1σ Confidence interval=\left[E\left(X\right)-σ\left(X\right),E\left(X\right)+σ\left(X\right)\right]=[196, 224]$$

$$2σ Confidence interval=\left[E\left(X\right)-2σ\left(X\right),E\left(X\right)+2σ\left(X\right)\right]=[182, 240]$$

$$3σ Confidence interval=\left[E\left(X\right)-3σ\left(X\right),E\left(X\right)+3σ\left(X\right)\right]=[168, 254]$$