# CH7 20

According to the standard normal value calculation formula [7-5]:

Z(x=30) = (X-mean)/SD = (30-29)/5 = 0.2

Z(x=34) = (X-mean)/SD = (34-29)/5 = 1.0

Z(x=23) = (X-mean)/SD = (23-29)/5 = -1.2

Z(x=30) = (X-mean)/SD = (40-29)/5 = 2.2

According to Areas under the Normal Curve:

P(z=0.2)=0.0793

P(z=1.0)=0.3413

P(z=-1.2)=0.3849

P(z=2.2)=0.4861

1. P(30M<number of viewers<34M)= P(z=1.0)-P(z=0.2) = 0.3413-0.0793= **0.262**
2. P(number of viewers>23M)= P(z=-1.2)+0.5=0.3849+0.5 = **0.8849**
3. P(number of viewers>40M)=0.5-P(z=2.2) = **0.0139**

# CH7 28

P=0.475 => z= 1.96

X1 = Mean – z\*SD = $26,889 – 1.96\*$4,500 = $18,069

X2 = Mean + z\*SD = $26,889 + 1.96\*$4,500 = $35,709

At private university, 95% of all students pay less than $35,709, and more than $18,069.

# CH7 38 (a,b,c)

1. P(Arrival<10,000) = EXPON.DIST(10000,1/100000,TRUE) = 0.095163
2. P(Arrival>120,000) = 1- P(Arrival<120,000)= 1- EXPON.DIST(120000,1/100000,TRUE) = 1- 0.698806 = 0.301194
3. P(60,000< X <100,000) = P(Arrival<100,000) – P(Arrival<60,000)= EXPON.DIST(100000,1/100000,TRUE) - EXPON.DIST(60000,1/100000,TRUE) = 0.632121 – 0.451188 = 0.180932

# CH8 42

1. Standard error of the sample mean σx̄ = σ/√n = 100 /√60 = 100 / 7.745967 = 12.90994
2. Z(x̄=477) = (x̄- μ)/ (σ/√n ) = (477 – 502) / 12.90994 = - 1.9365

Z(x̄=527) = (x̄- μ)/ (σ/√n ) = (527 – 502) / 12.90994 = 1.9365

P(1.94) = 0.4738

So, P(477< x̄<527) = 2\* P(1.94) = **0.9476**

1. Z(x̄=492) = (x̄- μ)/ (σ/√n ) = (492 – 502) / 12.90994 = - 0.7746

Z(x̄=512) = (x̄- μ)/ (σ/√n ) = (512 – 502) / 12.90994 = 0.7746

P(0.77) = 0.2794

So, P(492< x̄<512) = 2\* P(0.77) = **0.5588**

1. Z(x̄=550) = (x̄- μ)/ (σ/√n ) = (550 – 502) / 12.90994 = 3.7181

Since P(3.09) = 0.4990

So, P( x̄>552) is even **less than 0.001**, found by 0.5 – 0.4490.

# CH8 44

1. Standard error of the sample mean σx̄ = σ/√n = 0.33 /√40 = 100 / 7.745967 = 0.0521776
2. Z(x̄=3.46) = (x̄- μ)/ (σ/√n ) = - 0.7666

Z(x̄=3.54) = (x̄- μ)/ (σ/√n ) = 0.7666

P(0.77) = 0.2794

So, P(3.46< x̄<3.54) = 2\* P(0.77) = **0.5588**

1. Z(x̄-μ=0.01) = (x̄- μ)/ (σ/√n ) = 0.01/0.05218 = 0.1917

P(0.19) = 0.0753

So, P(x̄-μ<0.01) = 0.5+ P(0.19)= **0.5753**

1. Z(x̄=3.60) = (x̄- μ)/ (σ/√n ) = 1.9165

P(1.92) = 0.4726

So, P(x̄>3.60) = 0.5 - P(1.92) = **0.0274**

# CH8 46



From Megestat got above data. So the population mean is **$221.10** and population standard deviation is **$47.11**.



Used Excel to generate the sample with 10 data. And from Megestat got above data. So the sample mean is **$219.14** and sample standard deviation is **$36.24**.

Z(x̄=219.14) = (x̄- μ)/ (σ/√n ) = - 0.13157

P(0.13) = 0.0517

So, the likelihood of sample mean of $219.14 is **5.17%**. And the likelihood of sample mean larger than $219.14 is **55.17%**, found by 0.5+0.0517.