———— 8/30/2006 10:55:28 AM ————————————————————————————

```
Welcome to Minitab, press F1 for help.
Saving file as: C:\rjs\Courses\3332\Minitab Demos\MINITABDEMO2.MPJ

# We'll get the full  binomial(5, 0.51) distribution for Example25, page 96..
# First, set the x values {0, 1, ..., 5} into a column.
# Then ask for the probabilities attached to these values.

MTB > Set c1
DATA>   1( 0 : 5 / 1 )1
DATA>   End.
MTB > PDF c1;
SUBC>   Binomial 5 .51.
```

Probability Density Function

```
Binomial with n = 5 and p = 0.510000

         x     P( X = x )
      0.00        0.0282
      1.00        0.1470
      2.00        0.3060
      3.00        0.3185
      4.00        0.1657
      5.00        0.0345

# Now let's look at the so-called Poisson approximation to the binomial.
# Let's look at binomial(20,0.3) and binomial(20,0.03),
# and then Poisson(6) and Poisson (0.6).  (These Poisson distributions
# have means matching the two binomial distributions, respectively.)
# Below, you see the probabilities for these four distributions, stopping the
# Poisson probabilities at x=20.
# Note that Poisson(6) does not match binomial(20,0.3).
# But Poisson(0.6) matches binomial(20,0.03) very well.
# In the 1st comparison, we have np^2 = 20 x (0.3)^2 = 1.8 (not a good upper bound
# a difference of two probabilities.
# In the 2nd comparison, we have np^2 = 20 x ((0.03)^2 = 0.018 (not too bad).

MTB > Set c2              ## setting the desired x-values {0, 1, ..., 20} into
column c2
DATA>   1( 0 : 20 / 1 )1
DATA>   End.

MTB > PDF c2;             ## asking for the binomial(20,0.3) pdf (probability
density function)
SUBC>   Binomial 20 .3.
```

Probability Density Function

```
Binomial with n = 20 and p = 0.300000

         x     P( X = x )
      0.00        0.0008
      1.00        0.0068
      2.00        0.0278
      3.00        0.0716
      4.00        0.1304
      5.00        0.1789
      6.00        0.1916
```

```
      7.00        0.1643
      8.00        0.1144
      9.00        0.0654
     10.00        0.0308
     11.00        0.0120
     12.00        0.0039
     13.00        0.0010
     14.00        0.0002
     15.00        0.0000
     16.00        0.0000
     17.00        0.0000
     18.00        0.0000
     19.00        0.0000
     20.00        0.0000

MTB > PDF c2;
SUBC>   Binomial 20 .03.
```

Probability Density Function

```
Binomial with n = 20 and p = 0.0300000

         x     P( X = x )
      0.00        0.5438
      1.00        0.3364
      2.00        0.0988
      3.00        0.0183
      4.00        0.0024
      5.00        0.0002
      6.00        0.0000
      7.00        0.0000
      8.00        0.0000
      9.00        0.0000
     10.00        0.0000
     11.00        0.0000
     12.00        0.0000
     13.00        0.0000
     14.00        0.0000
     15.00        0.0000
     16.00        0.0000
     17.00        0.0000
     18.00        0.0000
     19.00        0.0000
     20.00        0.0000

MTB > PDF c2;
SUBC>   Poisson 6.
```

Probability Density Function

```
Poisson with mu = 6.00000

         x     P( X = x )
      0.00        0.0025
      1.00        0.0149
      2.00        0.0446
      3.00        0.0892
      4.00        0.1339
      5.00        0.1606
      6.00        0.1606
      7.00        0.1377
      8.00        0.1033
```

```
      9.00        0.0688
     10.00        0.0413
     11.00        0.0225
     12.00        0.0113
     13.00        0.0052
     14.00        0.0022
     15.00        0.0009
     16.00        0.0003
     17.00        0.0001
     18.00        0.0000
     19.00        0.0000
     20.00        0.0000

MTB > PDF c2;
SUBC>   Poisson .6.
```

Probability Density Function

```
Poisson with mu = 0.600000

         x     P( X = x )
      0.00        0.5488
      1.00        0.3293
      2.00        0.0988
      3.00        0.0198
      4.00        0.0030
      5.00        0.0004
      6.00        0.0000
      7.00        0.0000
      8.00        0.0000
      9.00        0.0000
     10.00        0.0000
     11.00        0.0000
     12.00        0.0000
     13.00        0.0000
     14.00        0.0000
     15.00        0.0000
     16.00        0.0000
     17.00        0.0000
     18.00        0.0000
     19.00        0.0000
     20.00        0.0000

MTB >
```