normcdf

If $Z \sim N(0, 1)$, then the MATLAB function `normcdf` computes $\text{normcdf}(z) = P(Z \leq z)$.

The above figure was made with the following commands:

```matlab
z = [-4:.01:4];
p = normcdf(z);
plot(z,p)
grid on
```

CLT Test

We can test the Central Limit Theorem. Let $X$ be the sum of 100 i.i.d. squared uniform random variables. Let $X_1, X_2, \ldots, X_{10000}$ be i.i.d. with the same distribution as $X$. We have already written the MATLAB function to generate the 10000 random variables:

```matlab
X = SampleUniformSqSums(10000,100);
```

Now we can compute (for example) the fraction of the $X_k$'s that are between 30 and 40:

```matlab
num = 0;
for k = 1:10000
    if X(k) >= 30 & X(k) <= 40
        num = num + 1;
    end
end
fract = num/10000 % if we leave off the semicolon,
                  % then MATLAB will output the answer
```

```
fract =

0.8580
```

In class we will compute the same quantity analytically using an approximation from the Central Limit Theorem. The two answers will be quite similar.