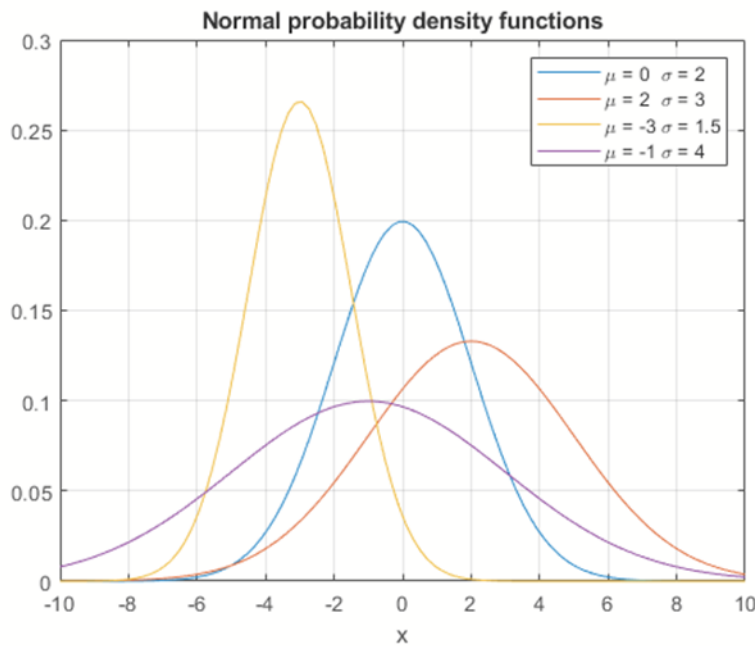# Normal Probability Density Function

The normal (Gaussian) probability densify function for several mean and standard deviation values is shown below.

Normal probability density functions

In general, the equation for the normal probability density function is given by:

$$f(x|\mu,\sigma) = \frac{1}{\sqrt{2\pi\sigma^2}} e^{-\frac{(x-\mu)^2}{2\sigma^2}}$$

where μ is the expected value (mean) and σ is the standard deviation (hence σ^2 is the variance).

1. Create a vector x of 100 equally spaced values starting at -10 and going up to 10.
2. Assuming $\sigma = 2$, create the fraction $\frac{1}{\sqrt{2\pi\sigma^2}}$ as `frac`. (Remember, π is built into MATLAB as the variable `pi`.)
3. Assuming $\sigma = 2$ and $\mu = 1$, create a vector for the exponent $-\frac{(x-\mu)^2}{2\sigma^2}$ using the vector x as `powr`.
4. Finally, create a vector named f representing $f(x|\mu,\sigma)$ at the values in x using your `frac` and `powr` variables and the MATLAB function `exp`.

Script ⊘

Reference Solution | 🖫 Save | ↻ Reset | 📖 MATLAB Documentation

```matlab
1  % create x vector
2  x = linspace(-10,10,100);
3  mu = 1;
4  sigma = 2;
5
6  % create frac
7  frac = 1/(sqrt(2*pi*sigma^2));
8
9  % Powr Vec
10 powr = -((x-mu).^2)/(2*sigma^2);
11
12 % f Vector
13 f= frac*exp(powr);
14
15 % Uncomment plotting code below when ready to visualize results
16  plot(x,f); grid; xlabel('x'); ylabel('f');
```

▶ Run Script ⊘

Previous Assessment: All Tests Passed

Submit ⊘

✔ Is the vector x correct?

✔ Is the fraction value correct?

✔ Is the exponent vector correct?

✔ Is the pdf vector correct?