

```

% gda02_03
%
% operations on a probability distributions
% Supports Section 2.1.

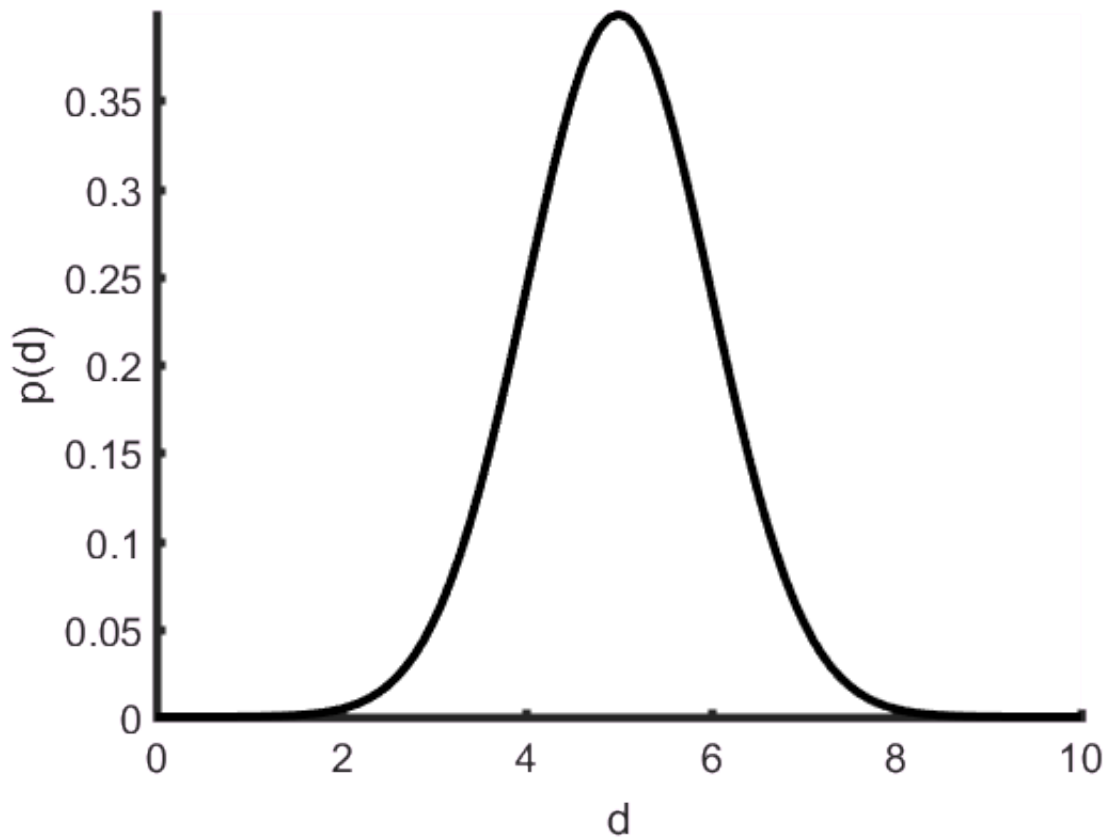
clear all;

% axes
Dd = 0.1;
N = 101;
d = Dd*[0:N-1]';
dmin=0;
dmax=10;

% Normal distribution
dbar = 5;
sigma = 1;
sigma2=sigma^2;
p = exp(-0.5*(d-dbar).^2/sigma2) / (sqrt(2*pi)*sigma);

% plot p
figure(1);
clf;
set(gca, 'LineWidth',3);
set(gca, 'FontSize',14);
hold on;
axis([0,10,0,max(p)]);
plot(d,p, 'k-', 'LineWidth',3);
xlabel('d');
ylabel('p(d)');

```



```
% Figure. Normal p.d.f.
```

```
% total probability
```

```
Ptotal = Dd * sum(p);
```

```
fprintf('total probabilyty %f\n', Ptotal );
```

```
total probabilyty 1.000000
```

```
% cumulative probability
```

```
P = Dd * cumsum(p);
```

```
figure(2);
```

```
clf;
```

```
set(gca,'LineWidth',3);
```

```
set(gca,'FontSize',14);
```

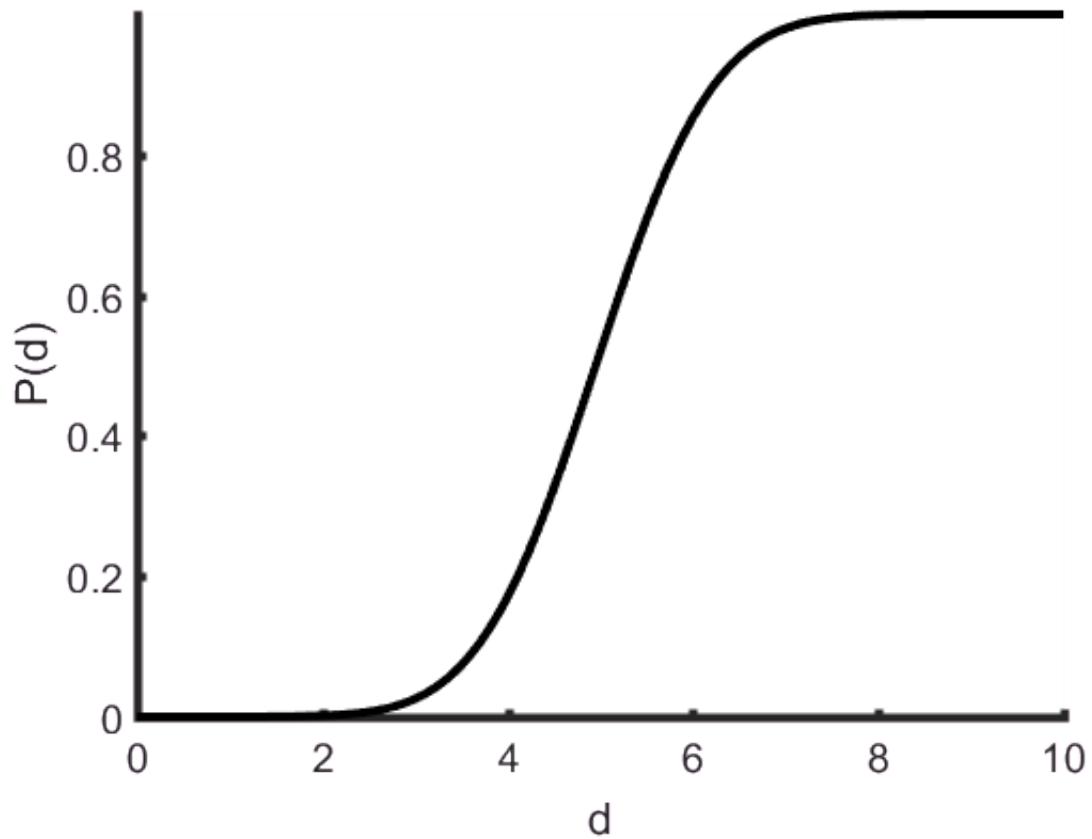
```
hold on;
```

```
axis([0,10,0,max(P)]);
```

```
plot(d,P,'k-','LineWidth',3);
```

```
xlabel('d');
```

```
ylabel('P(d)');
```



```
% Figure. Normal probability function (the integral of the Normal p.d.f.)
```

```
% mean and variance
```

```
Ed = Dd * sum(d.*p);
```

```
sigma2 = Dd * sum(((d-Ed).^2).*p);
```

```
fprintf('mean %f and variance %f\n', Ed, sigma2 );
```

```
mean 4.999998 and variance 0.999988
```