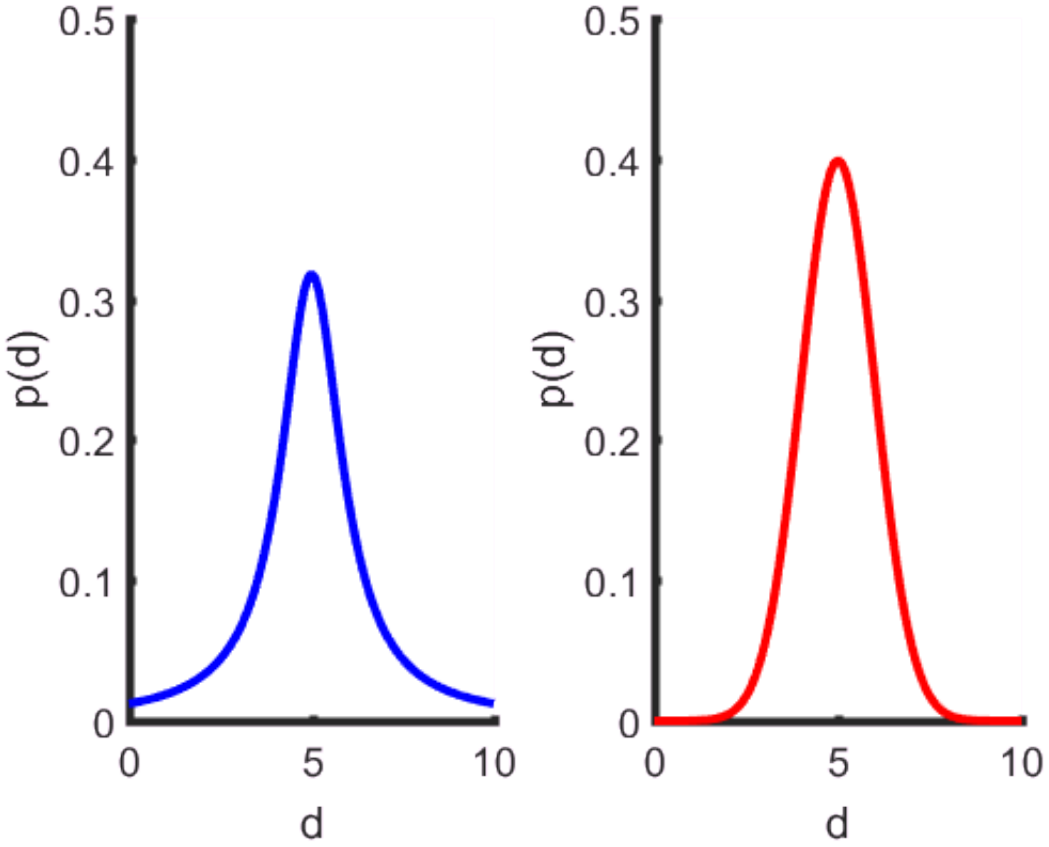
```
% gda03_04
%
% comparison of long-tailed and short tailed pdf's
% supports figure 3.4

clear all;

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

% short tailed pdf: Normal pdf
dbar=5;
d2=(d-dbar).^2;
sd = 1.0;
dbar = 5.0;
p1 = exp(-0.5*d2/(sd^2))/(sqrt(2*pi)*sd);
A1 = Dd*sum(p1);

% long-tailed distribution: Cauchy–Lorentz distribution
g = 1;
p2 = 1./(pi.*g.*(1+(d2./(g^2))));
A2 = Dd*sum(p2);

disp(sprintf('check on areas: true %f est1 %f est2 %f', 1, A1, A2));
```

```
check on areas: true 1.000000 est1 1.000000 est2 0.875551
```

```
figure(1);
clf;

% plot long-tailed pdf
subplot(1,2,2);
set(gca,'LineWidth',3);
set(gca,'FontSize',14);
hold on;
axis( [dmin, dmax, 0, 0.5 ] );
plot(d,p1,'r-','LineWidth',3);
xlabel('d');
ylabel('p(d)');

% plot short-tailed pdf
subplot(1,2,1);
set(gca,'LineWidth',3);
set(gca,'FontSize',14);
hold on;
axis( [dmin, dmax, 0, 0.5 ] );
plot(d,p2,'b-','LineWidth',3);
xlabel('d');
ylabel('p(d)');
```




```
% Figure 3.4 (A) Long-tailed probability density function. (B) Short-tailed
% probability density function. MatLab script gda03_04.
```