MATLAB Practical I: Playing with MATLAB

```
% Numbers and simple calculations:
  a = 422
  b = 522
  format compact
  a/b
  ans
  y = ans
  format long
  y
  (3^2)^3
  x = 2; y = x^x; z = y^y
  % this is a comment

% Elementary functions:
  sqrt(2)
  exp(1)
  log(ans)
  help exp
  rand
  gamma(7)
  airy(8)
  besselj(0,1)
  y = cos(1)
  pi
  cos(pi)
  sin(pi)
  sqrt(-1)
  exp(pi*sqrt(-1))
  abs(ans)
  help elfun

% for and if:
  for i = 1:10, i^5, end
  for x = 1:10
     if x^2 == 8*x-15, x, end
  end

% Vectors and matrices:
  format short
  x = [1 2 3]
  y = [2 3 4]'
  x*y
  y*x
  1:5
  (1:5)'
  factor(123456)
  prod(ans)
  A = [1 2 3; 4 5 6; 1 3 2]
  A^2
  A^10
  det(A)
  inv(A)
  det(inv(A))
  eig(A)
  rand(5,1)
  rand(1,5)
  rand(5,5)
  mean(1:10)
  mean(rand(10,1))
  mean(rand(100000,1))

% Information:
  who
  whos
  clear
  who

% Graphics:
  t = 0:.2:20;
  whos
  plot(t,sin(t))
  plot(t,sin(t),'linewidth',6)
  plot(t,sin(t),'*')
  plot(t,t^2)
  plot(t,t.^2)
  plot3(sin(t),cos(t),t)
  grid on
  xlabel('x')
  ylabel('y')
  zlabel('z','fontsize',30)
  title('\gamma = e^\pi','fontsize',20)
  contour(peaks)
  mesh(peaks)
  penny
  klein1
  knot
  cruller
  help graphics

% m files:
```

the file `cubeit.m`

```
while 0==0
  x = input('x? ');
  cube = x^3
end;
```

the file `g.m`

```
function g = g(x)
g = exp(x)-4*x;
```

```
  g(0)
  g(0:5)
  fplot('g',[0 2])
  grid on
  integral = quad('g',0,2)
  minimum = fminbnd('g',0,2)
  g(minimum)
  zero = fzero('g',0)
  g(zero)

% For more info:
  help
  help eig
  helpwin eig
  doc eig
  help demos
  demo
  truss
  xpsound
```

http://www.mathworks.com/access/helpdesk/help/techdoc/matlab.html