lecture 5.3 example 1

preliminaries

```
# clear workspace
rm(list=ls())
# set random seed
set.seed(123)
```

simulation parameters

```
nSamples = 10000
M =3
```

define functions

```
pFn = function(x) {
  if (x>=0 && x<0.25)
    8 * x
  else if (x >=0.25 && x<=1)
    8/3 -8 * x/3
  else
    0
}

gFn = function(x) {
  if (x>=0 && x<=1)
    1
  else
    0
}
```

simulate and plot results

```
nDraws = 0
nIter = 0
samples = c()

while (nDraws < nSamples) {
  xC = runif(1,0,1)
  acceptRatio = pFn(xC) /(M * gFn(xC))
  u = runif(1,0,1)
  nIter = nIter + 1
  if (acceptRatio >= u) {
    samples = c(samples, xC)
    nDraws = nDraws + 1
  }
```

```
}

#print(paste("nIter = ", nIter))

xGrid = seq(0,1,by=0.01)
yGrid = unlist(lapply(xGrid,pFn))
plot(xGrid,yGrid,col="red",lwd=2,type="l",
     xlab = "theta", ylab = "density")
lines(density(samples), lwd=2, col="blue", lty=2)
```