

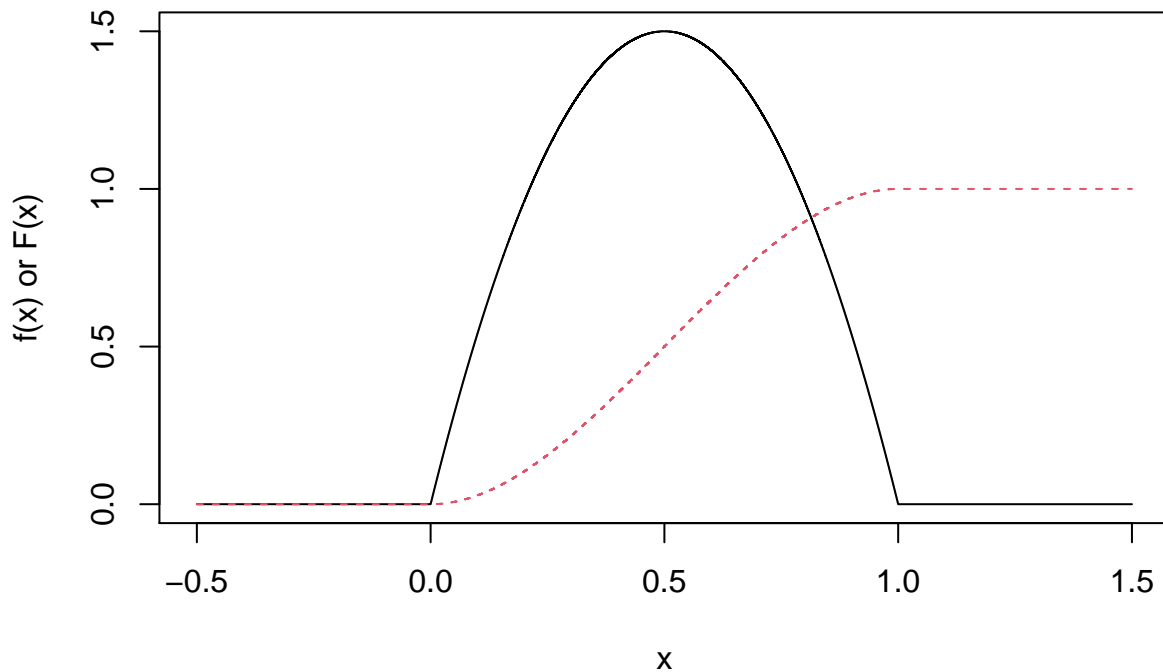
# WMS 4.126

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## pdf and CDF

Plots of the pdf and CDF of the distribution given in WMS 7th Ed. problme 4.126 are easily generated.

```
curve( 6*x*(1-x)*(0 < x & x < 1),  
       from=-0.5, to=1.5, n=100001,  
       ylab="f(x) or F(x)")  
curve( (3*x^2 - 2*x^3)*(0 < x & x < 1) + (x > 1),  
       from=-0.5, to=1.5, n=100001,  
       add=TRUE, lty=2, col=2)
```



## Area Under the Curve

The area under  $f(x)$  between  $x = 0.5$  and  $x = 0.8$  can also be plotted. The area is equal to the difference  $F(0.8) - F(0.5)$  which is shown in red.

```

f <- function(x){6*x*(1-x)*(0<=x)*(x<=1)}
F <- function(x){0+(3*x^2 - 2*x^3)*(0 < x & x < 1) + (x > 1)}
cord.x <- c(.5,seq(.5,.8,0.01),.8)
cord.y <- c(0,f(seq(.5,.8,0.01)),0)
curve( 6*x*(1-x)*(0 < x & x < 1),
       from=-0.5, to=1.5, n=100001,
       ylab="f(x) or F(x)")
curve( (3*x^2 - 2*x^3)*(0 < x & x < 1) + (x > 1),
       from=-0.5, to=1.5, n=100001,
       add=TRUE, lty=2, col=2)
polygon(cord.x,cord.y,col='skyblue')
abline(h=F(.5), lty=3, col=2)
abline(h=F(.8), lty=3, col=2)
text(0.65,0.125,"p=0.346", cex=0.75)
text(-0.4, F(.5), F(.5), col=2, cex=0.75)
text(-0.4, F(.8), F(.8), col=2, cex=0.75)

```

