

# ASSIGNMENT 6

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SUBJECT: MAT1011 L4

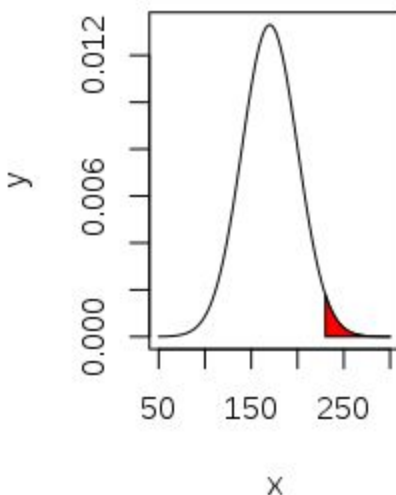
Registration no.: 19BCI7005

SLOT : L4

1. The serum cholesterol level  $X$  in 14-year old boys has approximately a normal distribution with mean 170 and standard deviation 30. (a). Find the probability that the serum cholesterol level of a randomly chosen 14-Year old boy exceeds 230.

```
1-pnorm(230,mean = 170,sd=30)
[1] 0.02275013
```

```
x=seq(50,300,length=250)
> y=dnorm(x,mean=170,sd=30)
> plot.new()
> plot(x,y,type="l")
> x=seq(230,300,length=70)
> y=dnorm(x,mean=170,sd=30)
> polygon(c(230,x,300),c(0,y,0),col="red")
```



(b). In a middle school there are 300, 14-year-old boys. Find the probability that at Least 8 boys have serum cholesterol level that exceeds 230.

```

1-pnorm(230,mean = 170,sd=30)
[1] 0.02275013
> p= 1-pnorm(230,mean = 170,sd=30)
> q= 1-p
> stddev=(300*p*q)^(0.5)
> u=300*p
> p
[1] 0.02275013
> q
[1] 0.9772499
> stddev
[1] 2.58259
> u
[1] 6.82504
> z=1-pnorm(8,mean=u,sd=stddev)
> z
[1] 0.324571

```

2. Lifetimes of batteries in a certain application are normally distributed with mean 50 hours and standard deviation 5 hours. Find the probability that a randomly chosen balm lasts between 42 and 52 hours.

```

pnorm(52,mean = 50,sd=5)-pnorm(42,mean = 50,sd=5)
[1] 0.6006224

```

```

x=seq(0,100,length=100)
> y=dnorm(x,mean = 50,sd=5)
> plot(x,y,type="l")
> x=seq(42,52,length=10)
> y=dnorm(x,mean = 50,sd=5)
> polygon(c(42,x,52),c(0,y,0),col="blue")

```

