# Normal Distribution

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## Wood-Burning Example

Suppose that the amount of wood that I burn per day is approximately normally distributed with a mean of 16 ft$^3$ and a standard deviation of 4 ft$^3$. Use this information to answer the questions below.

- What is an individual?
- What is the variable and what type of variable is it?
- On what proportion of days do I burn less than 22 ft$^3$ of wood?
- On what proportion of days do I burn more than 15 ft$^3$ of wood?
- On what proportion of days do I burn between 11 and 26 ft$^3$ of wood?
- What is the amount of wood burned per day such that I burn less than that amount on 10% of the days?
- What is the amount of wood burned per day such that I burn more than that amount on 20% of the days?
- What are the most common 50% of amounts of wood burned per day? \end{Enumerate}

## Load NCStats Package
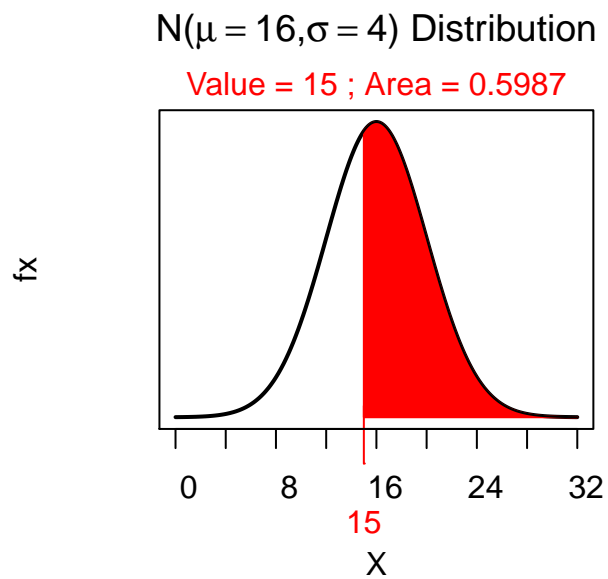
```
> library(NCStats)
```

**Forward, Less-Than**

```
> ( distrib(22,mean=16,sd=4) )
```
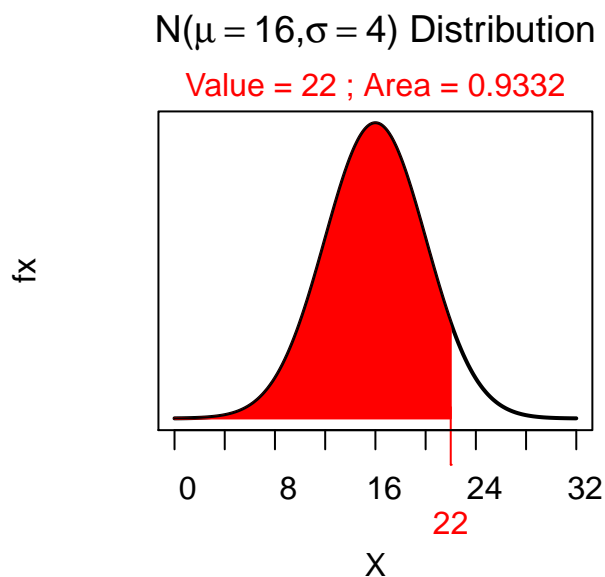
```
[1] 0.9331928
```

**Forward, Greater-Than**

```
> ( distrib(15,mean=16,sd=4,lower.tail=FALSE) )
```
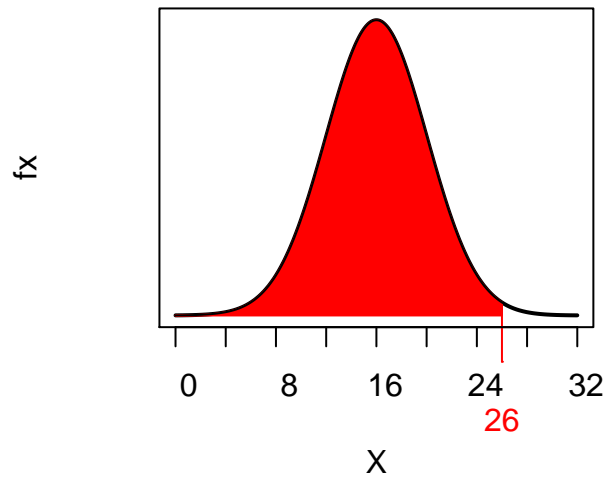
## N(μ = 16,σ = 4) Distribution
### Value = 15 ; Area = 0.5987



```
[1] 0.5987063
```

**Forward, Between**

```
> ( ab <- distrib(26,mean=16,sd=4) )
```

## N($\mu = 16, \sigma = 4$) Distribution
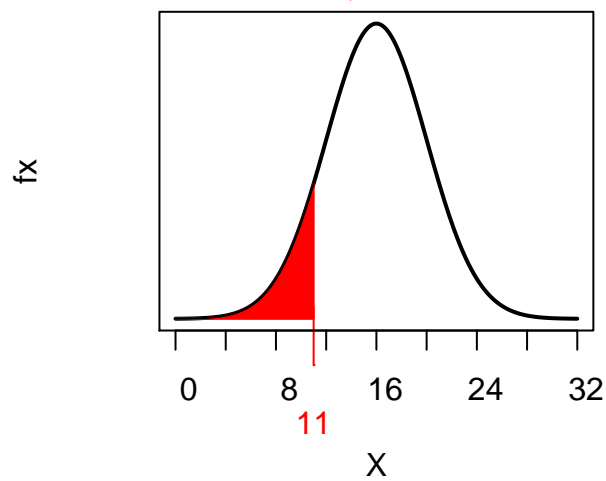
Value = 26 ; Area = 0.9938



```
[1] 0.9937903
```

```
> ( a <- distrib(11,mean=16,sd=4) )
```

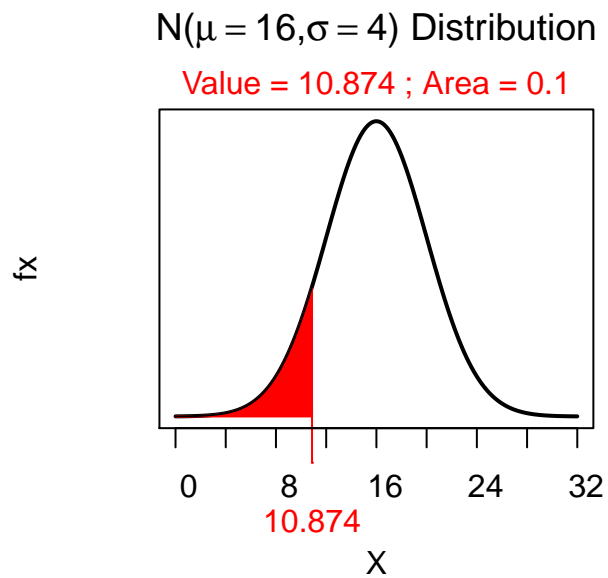## N($\mu = 16, \sigma = 4$) Distribution

Value = 11 ; Area = 0.1056



```
[1] 0.1056498
```

```
> ab-a
```

```
[1] 0.8881406
```

**Reverse, Less-Than}**

```
> ( distrib(0.1,mean=16,sd=4,type="q") )
```

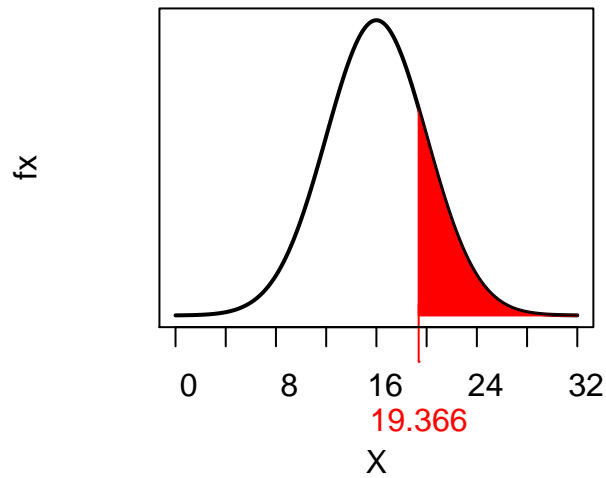### N($\mu = 16, \sigma = 4$) Distribution
Value = 10.874 ; Area = 0.1



```
[1] 10.87379
```

**Reverse, Greater Than**

```
> ( distrib(0.20,mean=16,sd=4,type="q",lower.tail=FALSE) )
```

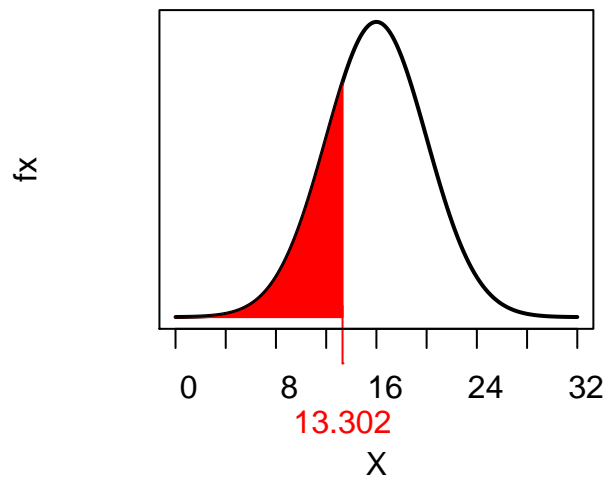## N(μ = 16, σ = 4) Distribution

Value = 19.366 ; Area = 0.2



```
[1] 19.36648
```

**Reverse, Between**

```
> ( distrib(0.25,mean=16,sd=4,type="q") )
```

## N(μ = 16, σ = 4) Distribution

Value = 13.302 ; Area = 0.25



```
[1] 13.30204
```
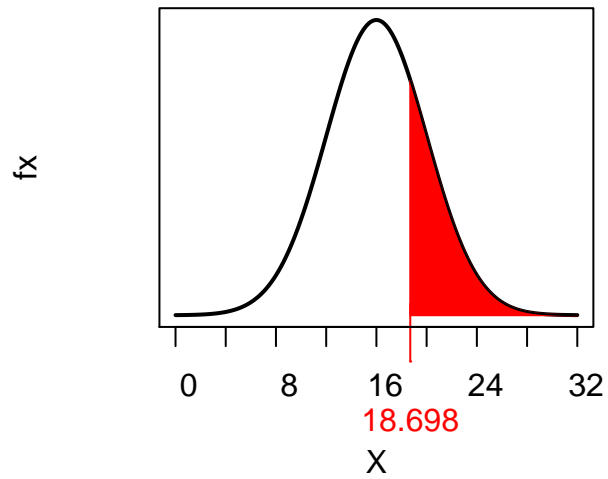
```
> ( distrib(0.25,mean=16,sd=4,type="q",lower.tail=FALSE) )
```

## N(μ = 16,σ = 4) Distribution

Value = 18.698 ; Area = 0.25

fx

0    8    16   24   32

18.698

X

```
[1] 18.69796
```