

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 ft³ and a standard deviation of 4 ft³. Use this information to answer the questions below.

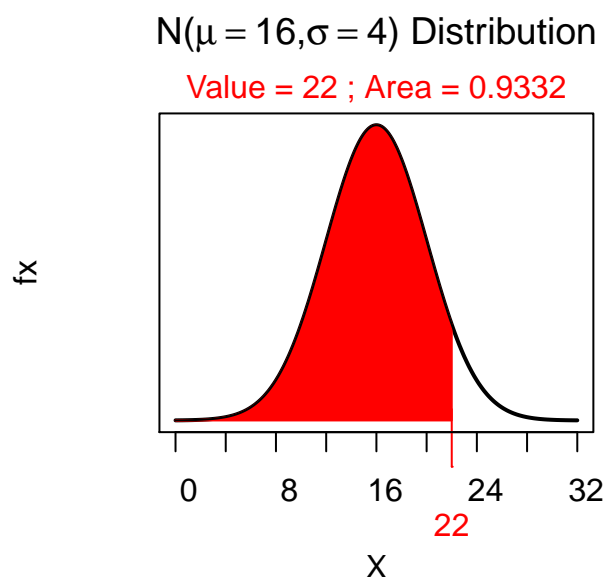
- What is an individual?
- What is the variable and what type of variable is it?
- On what proportion of days do I burn less than 22 ft³ of wood?
- On what proportion of days do I burn more than 15 ft³ of wood?
- On what proportion of days do I burn between 11 and 26 ft³ of wood?
- What is the amount 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?

Load NCStats Package

```
> library(NCStats)
```

Forward, Less-Than

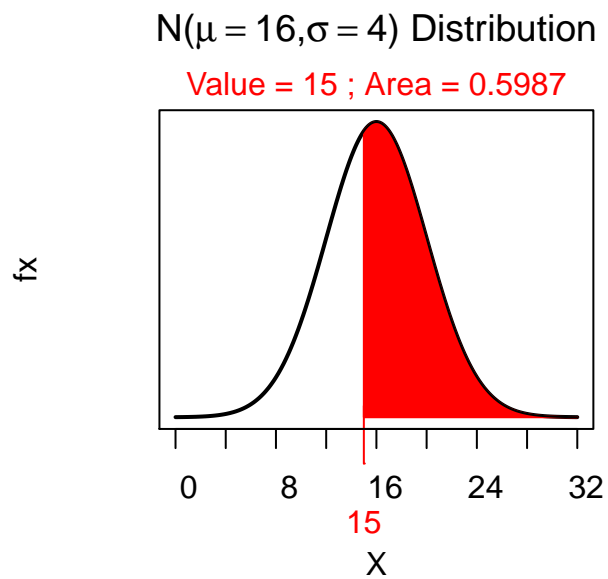
```
> ( distrib(22,mean=16,sd=4) )
```



```
[1] 0.9331928
```

Forward, Greater-Than

```
> ( distrib(15,mean=16,sd=4,lower.tail=FALSE) )
```



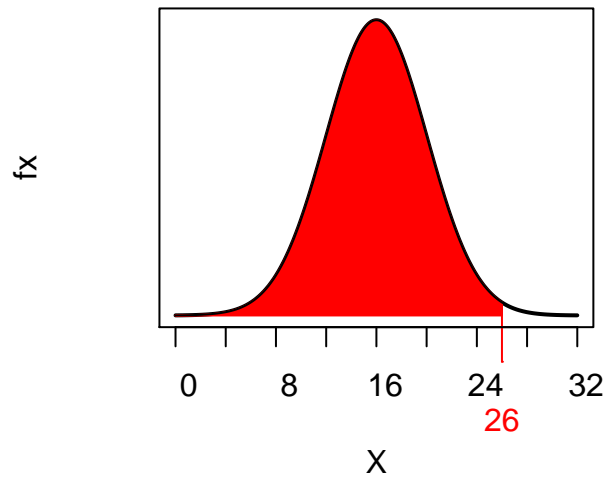
```
[1] 0.5987063
```

Forward, Between

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

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

Value = 26 ; Area = 0.9938

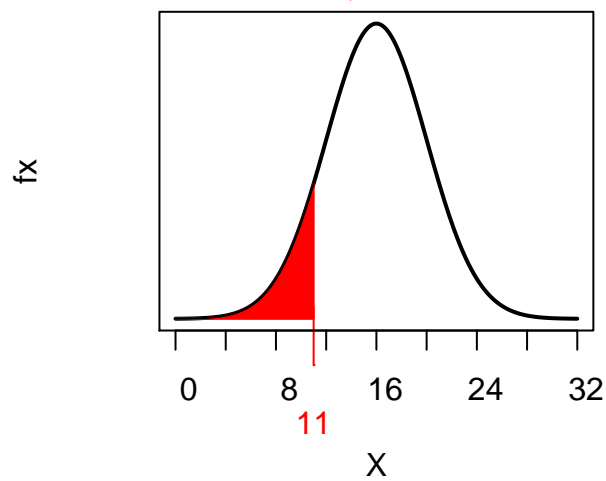


[1] 0.9937903

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

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

Value = 11 ; Area = 0.1056



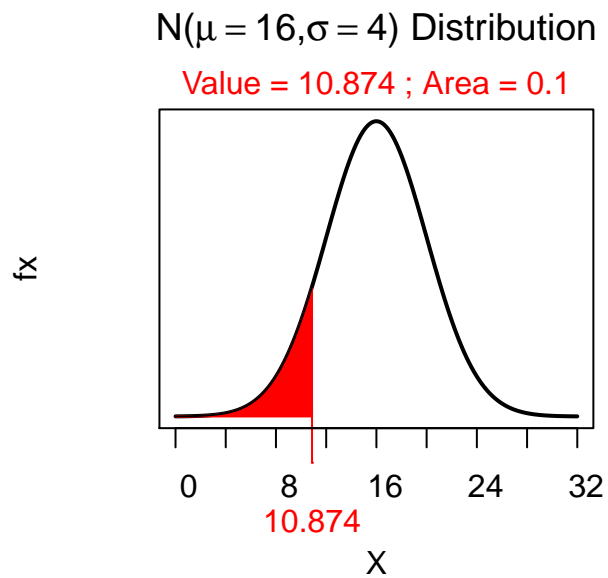
[1] 0.1056498

```
> ab-a
```

[1] 0.8881406

Reverse, Less-Than}

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



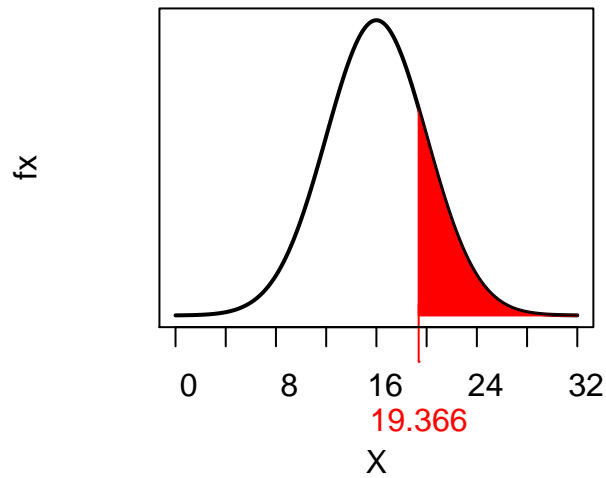
```
[1] 10.87379
```

Reverse, Greater Than

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

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

Value = 19.366 ; Area = 0.2



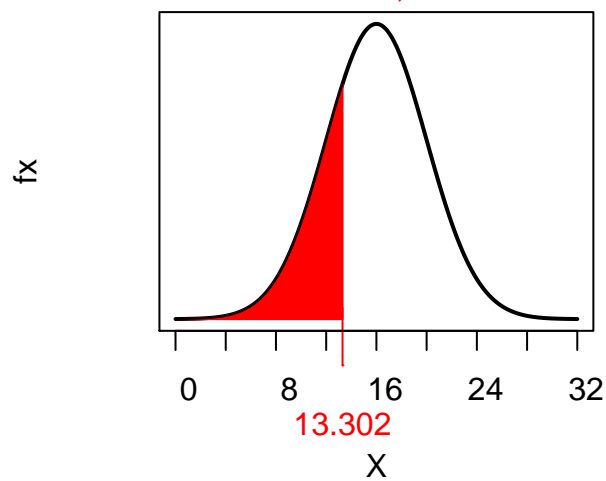
[1] 19.36648

Reverse, Between

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

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

Value = 13.302 ; Area = 0.25

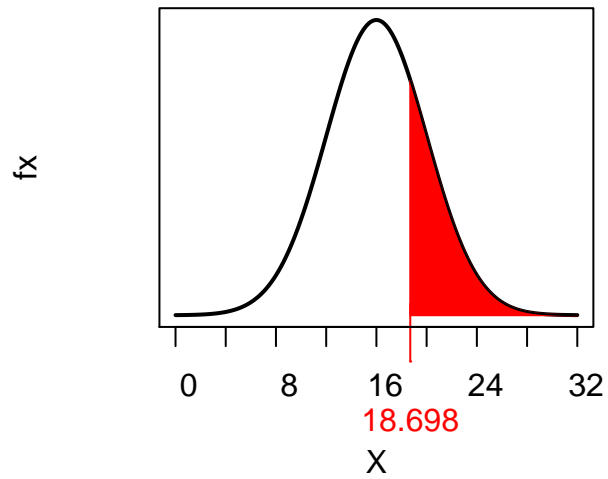


[1] 13.30204

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

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

Value = 18.698 ; Area = 0.25



```
[1] 18.69796
```