

Chapter 14 / **Example 11**

# Calculate normal probabilities

The GDC will calculate normal probabilities directly from *any* distribution without the need to standardize the variable.

$X \sim N(10, 2^2)$ . Find:

**a**  $P(X < 13)$

**b**  $P(X > 9)$

**c**  $P(9.1 < X < 10.3)$

Press **2nd** **vars** (**[distr]**) 2:normalcdf(

Set the lower bound to  $-1E99$ , the upper bound to 13,  $\mu$  to 10,  $\sigma$  to 2 and leave.

$-1E99$  means  $-1 \times 10^{99}$  - a very small number.

To enter E press **2nd** **[,]** (**[EE]**).

Navigate to Paste and press **enter**.

```
normalcdf
lower: -1E99
upper: 13
μ: 10
σ: 2
Paste
```

Press **enter**.

$P(X < 13) = 0.933$

```
normalcdf(-1E99,13,10,2)
.....9331927713
```

Press **2nd** **vars** (**[distr]**) 2:normalcdf(

Set the Lower bound to 9, the Upper Bound to  $1E99$ ,  $\mu$  to 10 and  $\sigma$  to 2.

$1E99$  means  $1 \times 10^{99}$  - a very large number.

To enter E press **2nd** **[,]** (**[EE]**).

Navigate to Paste and press **enter**.

```
normalcdf
lower: 9
upper: 1E99
μ: 10
σ: 2
Paste
```

Press **enter**.

$P(X > 9) = 0.691$

```
normalcdf(9,1E99,10,2)
.....6914624678
```

Press **2nd** **vars** (**[distr]**) 2:normalcdf(

Set the Lower bound to 9.1, the Upper Bound to 10.3,  $\mu$  to 10 and  $\sigma$  to 2.

Navigate to Paste and press **enter**.

```
normalcdf
lower: 9.1
upper: 10.3
μ: 10
σ: 2
Paste
```

Press **enter**.

$P(9.1 < X < 10.3) = 0.233$

```
normalcdf(9.1,10.3,10,2)
.....2332624714
```