

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 **MENU** 2 **STAT** to display the List Editor screen.

Press **F5** DIST **F1** NORM **F2** Ncd

Select Data **F2** Var

Enter -1×10^{99} as the value of Lower using **x10^x**, 13 as the value of Upper, 2 as the value of σ , 10 as the value of μ and leave the other variables unchanged.

Use **▼** to navigate down to Execute and press **EXE**.

```
Normal C.D
Data :Variable
Lower : -1×1099
Upper : 13
σ : 2
μ : 10
Save Res:None
List Var
```

$P(X < 13) = 0.933$

```
Normal C.D
p = 0.93319279
z:Low = -5×1098
z:Up = 1.5
```

Press **EXIT**

Enter 9 as the value of Lower, 1×10^{99} as the value of Upper using **x10^x**, 2 as the value of σ , 10 as the value of μ and leave the other variables unchanged.

Use **▼** to navigate down to Execute and press **EXE**.

```
Normal C.D
Data :Variable
Lower : 9
Upper : 1×1099
σ : 2
μ : 10
Save Res:None
List Var
```

Press **Í**.

$P(X > 9) = 0.691$

```
Normal C.D
p = 0.69146246
z:Low = -0.5
z:Up = 5×1098
```

Press **EXIT**

Enter 9.1 as the value of Lower, 10.3 as the value of Upper, 2 as the value of σ , 10 as the value of μ and leave the other variables unchanged.

Use **▼** to navigate down to Execute and press **EXE**.

```
Normal C.D
Data :Variable
Lower : 9.1
Upper : 10.3
σ : 2
μ : 10
Save Res:None
List Var
```

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

Normal C.D
Data : Variable
Lower : 9.1
Upper : 10.3
 σ : 2
 μ : 10
Save Res: None
☐ List ☐ Var 