

Chapter 13 / **Example 12**

# Using the normal distribution

The weights of cauliflowers purchased by a supermarket from their suppliers are distributed normally with mean 821 g and standard deviation 40 g.

Cauliflowers weighing less than 750 g are classified as small.

- Predict the number of cauliflowers classified as small in a sample of 400 cauliflowers.
- The heaviest 8% of cauliflowers are classified as oversized and re-packaged. Find the range of weights of cauliflowers classified as oversized.

$W \sim N(821, 40^2)$  find  $P(W \leq 750)$  Press **MENU** 2 **STAT** to display the List Editor screen.

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

Select Data **F2** Var.

Enter  $-1 \times 10^{10}$  as the value of Lower using **x10<sup>10</sup>**, 750 as the value of Upper, 40 as the value of  $\sigma$ , 821 as the value of  $\mu$  and the other items unchanged.

Choose **F2** List for Save Res, type 1 and press **EXE**.

```
Normal C.D
Data      :Variable
Lower     :-1×1010
Upper     :750
σ         :40
μ         :821
Save Res:List1
[None] LIST
```

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

$P(W \leq 750) = 0.0380$ .

```
Normal C.D
p         =0.03794894
z:Low     =-2.5×1008
z:Up      =-1.775
```

Press **MENU** 1 **RUN-MAT** to display the Run-Matrix screen for arithmetical calculations.

Type  $400 \times$ .

Press **OPTN** **F1** LIST **F1** List and type 1 and press **EXE** **□**

The expected number of cauliflowers is

$400 \times P(W \leq 750) = 15.2$ .

15 cauliflowers are predicted to be classified as small.

```
400×List 1
{15.17957744, -1.0000}
List Lst→Mat Dim Fill( Seq
```

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Press **EXIT** twice to return to the List Editor screen.

Press **F5** DIST **F1** NORM **F3** InvN.

Select Data **F2** Var and Select Tail **F2** RIGHT.

Enter 0.08 as the Area, 40 as the value of  $\sigma$ , 821 as the value of  $\mu$  and the other items unchanged.

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

```

Inverse Normal
Data      :Variable
Tail      :Right
Area      :0.08
σ         :40
μ         :821
Save Res:None
[None] [LIST]
  
```

$w = 877.2$ .

Cauliflowers weighing at least 877 g will be classified as oversized.

```

Inverse Normal
xInv=877.202862
  
```