Chapter 13 / **Example 11**

Using the inverse normal function

The inverse normal function uses the lower-tail area. Care should be taken when calculating with this function to ensure the correct tail is being used.

For $X \sim N(21,9)$

1 Find x given that:

a $P(X < x) = 0.8$ **b** $P(X > x) = 0.4$

2 **a** Find a and b given that $P(a < X < b) = 0.68$ and a and b are an equal distance either side of the mean.

b Verify that this supports the statement that approximately 68% of all data for a normally distributed population is likely to lie within one standard deviation of the mean.

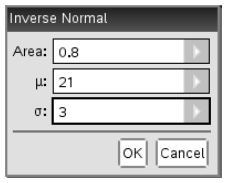
Open a new document and add a Calculator page.

Press menu 5:Probability | 5:Distributions | 3:Inverse Normal…

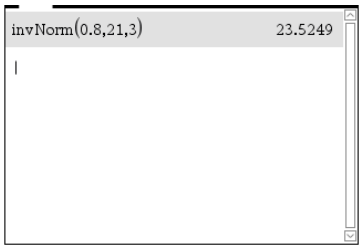
Enter the Area 0.8.

Set μ to 21 and σ to 3.

Press enter.



x = 23.5.



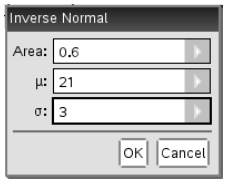
To use the inverse normal function, find $1 - P(X < x) = 0.4$, that is $P(X < x) = 1 - 0.4 = 0.6$.

Press menu 5:Probability | 5:Distributions | 3:Inverse Normal…

Enter the Area 0.6.

Set μ to 21 and σ to 3.

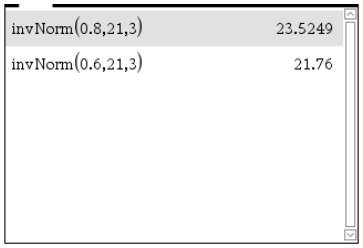
Press enter.



Chapter 13 / **Example 11**

Using the inverse normal function

x = 21.8.



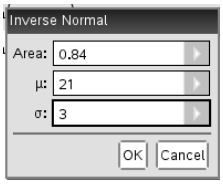
$P(x < b) = 0.5 + \frac{0.68}{2} = 0.84$.

Press menu 5:Probability | 5:Distributions | 3:Inverse Normal…

Enter the Area 0.84.

Set μ to 21 and σ to 3.

Press enter.



b = 24.0.

$a = 21 - (24.0 - 21) = 18.0$.

$18.0 = \mu - \sigma$, $24.0 = \mu + \sigma$.