(5) **Drug company**
Manufacturing and selling drugs that claim to reduce an individual's cholesterol level is big business. A company would like to market their drug to women if their cholesterol is in the top 15%. Assume the cholesterol levels of adult American women can be desribed by a Normal model with a mean of 188 mg/dL and a standard deviation of 24 mg/dL.

(a) Use R to draw and label the Normal model.

(b) What percent of adult women do you expect to have cholesterol levels over 200 mg/dL?

(c) What percent of adult women do you expect to have cholesterol levels between 150 mg/dL and 170 mg/dL?

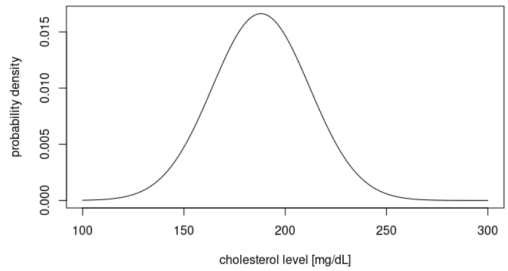
(d) Calculate the interquartile range of the cholesterol levels. Recall, the interquartile range is the diference between upper and lower quartile, i.e.

$$IQR = x_{0.75} - x_{0.25}.$$

(e) Above what value are the highest 15% of women's cholesterol levels?

Hint: If using R for all computations the following commands `pnorm()`, `qnorm()` and `dnorm()` are useful. Otherwise values from Table of standard Normal distribution should be used.

a)



b) X... Cholesterol level in mg/dL

$P(X > 200) = 1 - P(X \leq 200) \approx 0{,}31$ pnorm(200, μ, σ, lower.tail = FALSE)

c) $P(150 < X < 170) = 1 - P(X \leq 150 \vee 170 \leq X) = 1 - P(X \leq 150) - P(X \geq 170) \approx 0{,}17$

d) $IQR \approx 32{,}38$ mg/dL qnorm($\frac{75}{100}$, μ, σ) - qnorm($\frac{25}{100}$, μ, σ)

e) above 212.87 mg/dL qnorm($\frac{15}{100}$, μ, σ, lower.tail = FALSE)