Let us suppose \( X \sim N(4, 5) \). This means the distribution (density) looks like:

\[
\begin{align*}
\text{Area under curve: } 68\%
\end{align*}
\]

(a) \( P(X > 4.9) \)

\[
= 1 - P(X \leq 4.9)
\]

We need to calculate this probability.

To calculate \( P(X \leq 4.9) \) we need to standardise \( X \) by subtracting the mean and dividing by the standard deviation.

The area under both curves stay the same.

\[
\frac{4.9 - 4}{\sqrt{5}} = 0.402
\]
We write this calculation as follows:

\[
P(X \leq 4.9) = P\left( \frac{X - 4}{\sqrt{5}} \leq \frac{4.9 - 4}{\sqrt{5}} \right)
\]

normal with mean 4 and variance 5

\[
P(z \leq 0.402)
\]

Standard normal with mean zero and variance 1.

Therefore use tables to evaluate \( P(z \leq 0.402) = 0.6554 \).

\[
P(X > 4.9) = 1 - P(X \leq 4.9)
\]

\[
= 1 - P(z \leq 0.402) = 1 - 0.6554
\]

(ii) \( P(X \leq 6) \)?

Again to evaluate the probability we need to standardise:

\[
P(X \leq 6) = P\left( \frac{X - 4}{\sqrt{5}} \leq \frac{6 - 4}{\sqrt{5}} \right) = P(z \leq 0.894)
\]

In pictures this means:

\[\text{Standard normal}\]
Area under both curves are same.

Use tables to show that $P(Z \leq 0.894) \approx 0.8133$

Therefore $P(X \leq 6) = P(Z \leq 0.894) \approx 0.8133$.

(ii) $P(X \leq 3.2)$

Standardise

$\frac{3.2-4}{\sqrt{5}} = -0.358$
Therefore
\[ P(X \leq 3.2) = P\left( \frac{X - 4}{\sqrt{5}} \leq \frac{3.2 - 4}{\sqrt{5}} \right) = P(Z \leq -0.358) \]
(Use tables) \( \approx 0.348 \).

(iv) \( P(X \leq 2.3) \)

\[ P(X \leq 2.3) = P\left( \frac{X - 4}{\sqrt{5}} \leq \frac{2.3 - 4}{\sqrt{5}} \right) = P(Z \leq -0.76) \]
\[ = 0.2266. \]

(b)(i) \( P(3.2 < X \leq 6) \)

\[ = P(X \leq 6) - P(X < 3.2) \]
\[ \approx 0.8133 - 0.848 \].
b) \( P(2.3 < X < 4.9) = P(X < 4.9) - P(X < 2.3) = 0.6554 - 0.2266 \)

(\(\tau\)) \( P(2.3 < X < 4.9 \text{ or } 3.2 < X \leq 6) = P(2.3 \leq X \leq 6) - P(X \leq 2.3) = 0.8133 - 0.2266 \).