3.x) Conditional probabilities

Worked example

The time taken, X minutes, for a flight has a normal distribution with mean μ minutes.

Given that $P(X < \mu - 25) = 0.45$,

Find $P(X > \mu + 25 \mid X > \mu - 25)$

Your turn

The time taken, X minutes, for a flight has a normal distribution with mean μ minutes.

Given that $P(X < \mu - 15) = 0.35$,

Find $P(X > \mu + 15 \mid X > \mu - 15)$

$$\frac{7}{13}$$

Worked example

The length of time, L hours, that a phone will work before it needs charging is normally distributed with a mean of 20 hours and a standard deviation of 3 hours.

A person is about to go on a 2 hour journey. Given that it is 25 hours since they last charged their phone, find the probability that their phone will not need charging before the journey is completed.

Your turn

The length of time, L hours, that a phone will work before it needs charging is normally distributed with a mean of 100 hours and a standard deviation of 15 hours.

A person is about to go on a 6 hour journey. Given that it is 127 hours since they last charged their phone, find the probability that their phone will not need charging before the journey is completed.

0.39 (2 sf)