5.3 The Normal Distribution (Part B)
Z-Scores

Standard normal distribution

Z – score

Ex. Hailey belongs to a running club in Vancouver. Below are normally distributed times for the 200 metre sprint in Vancouver and on a recent trip to Lake Louise.

Location	Club Mean Time for 200m	Club Standard Deviation	Hailey's Run Time
Vancouver	25.75 seconds	0.62 seconds	24.95 seconds
Lake Louise	25.57 seconds	0.60 seconds	24.77 seconds

At which location was Hailey's run time better, when compared with the club results?

Ex. IQ (intelligence) scores are normally distributed with a mean of 100 and a standard deviation of 15. If a person scores 119 on an IQ test, how does this score compare with the scores of the general population?

Ex. Molly earned a score of 940 on a national achievement test. The mean test score was 850 with a standard deviation of 100. What proportion of students had a higher score than Molly? (Assume that test scores are normally distributed.)

Ex. Running shoes lose their shock-absorption after a mean distance of 640km, with a standard deviation of 160km. Zack is an elite runner and wants to replace his shoes at a distance when only 25% of people would replace their shoes. At what distance should he replace his shoes?