Part 3.4: Mixed Questions

1. An ice cream machine is set to pour out ice cream into cups. It is controlled to randomly cut the flow of ice cream between 200 g and 206 g. Find the probability it pours out:
   a. Less than 201 g.
   b. Between 202 g and 205 g.
   c. More than 205.5 g.
2. The maximum weight that can be sent using a standard parcel post bag is 3kg. Assuming the weight of the bags has a uniform distribution:
   a. Justify why a uniform distribution is best to use in this situation and state the value of the parameters (a and b).
   b. What is the probability it weighs more than 2.9 kg?
   c. What is the probability it weighs less than 1.8 kg?
3. The amount of time it takes for a grenade to go off it anywhere between 6 seconds and 8 seconds.
   a. Justify why a uniform distribution is best to use in this situation and state the value of the parameters (a and b).
   b. What is the probability it takes between 6.2 and 6.6 seconds to go off?
   c. What is the probability it goes off in under 5 seconds?
4. The cost to fill my car with petrol is between $40 and $90 depending on how long between visits to the petrol station.
   a. Justify why a uniform distribution is best to use in this situation and state the value of the parameters (a and b).
   b. What is the probability it costs more than $70 to fill my car?
   c. Between what two values do the middle 90% of fill ups cost?
5. The northern explorer train departs Auckland at 7:50 am and arrives in Wellington between 6:20 pm and 6:30 pm.
   a. Justify what distribution would be best to model the time taken to travel between Auckland and Wellington and state the value of the parameters (a and b).
   b. What is the probability it takes more than 10 hours and 5 minutes to complete the journey?
   c. What is the probability it takes less than 9 hours to complete the journey?
6. I always drink more than 1 L of water a day and always drink less than 2.1 L.
   a. Justify what distribution would be best to model the amount of water I drink in a day and state the value of the parameters (a and b).
   b. What is the probability I drink more than 2 L of water in a day?
   c. Between what two values do I drink on the middle 90% of days?
7. The diagonal measurement of a 'standard' 40 inch TV is anywhere between 101.2 cm and 102.1 cm.
   a. Justify what distribution would be best to model the diagonal measurement of a 'standard' 40 inch TV and state the parameters (a and b).
   b. What is the probability it is actually more than 40 inches (101.6 cm)?
   c. Under what length are the smallest 10% of 'standard' 40 inch TVs?