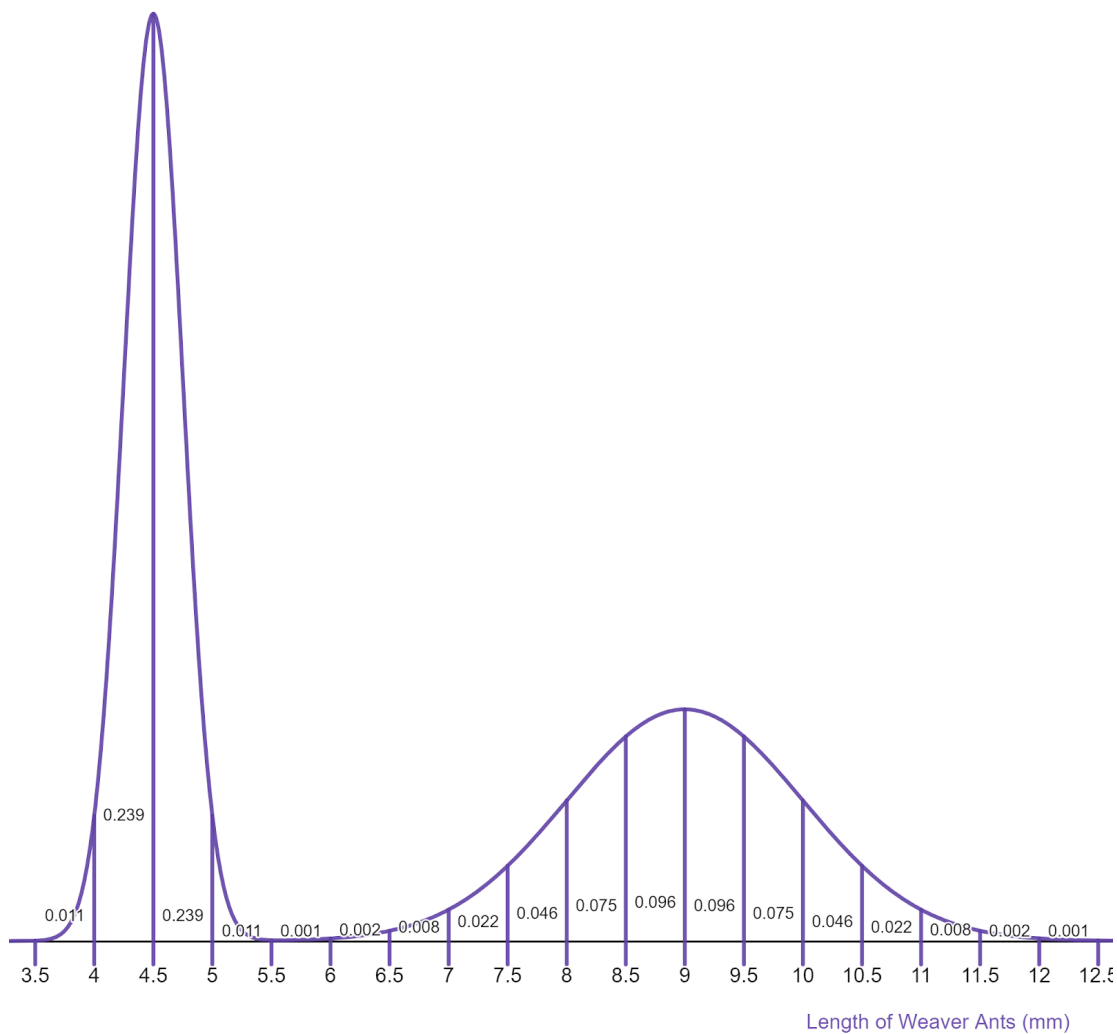


### 5.1.1: Exercises

- Weaver worker ants have a bimodal length distribution. There are two types of workers, minors and majors. The majors have an average length of 9 mm and minors average half the length. Complete the following probability questions. Include probability notation in your answers.

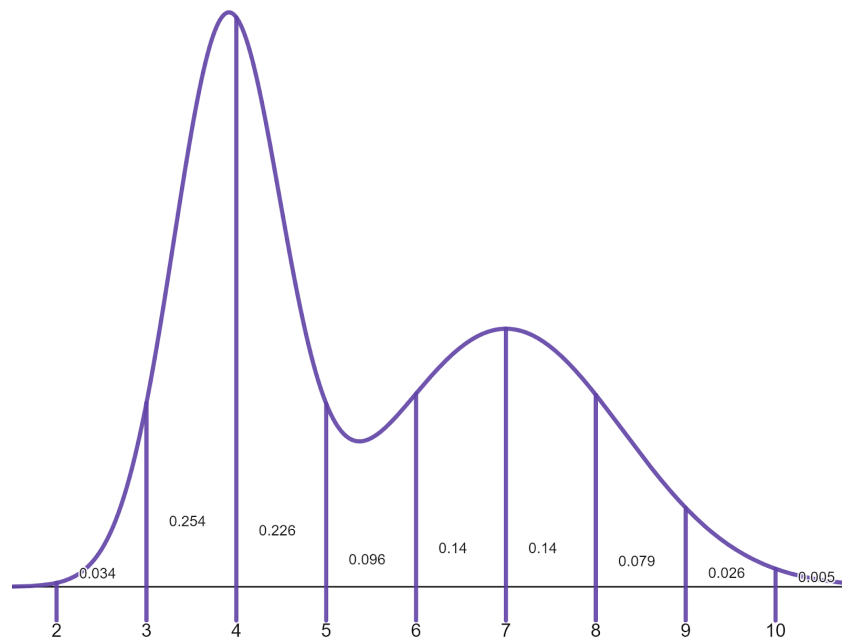


Images are created with the graphing calculator, used with permission from Desmos Studio PBC.

- What proportion of weaver ants are between 4.5 and 8 mm long?

- b. What proportion of weaver ants are between 9.5 and 11 mm long?
  
  
  
  
  
  
  
  
  
  
- c. Find the probability that a randomly selected weaver ant is at most 4.5 mm long.
  
  
  
  
  
  
  
  
  
  
- d. Find the probability that a randomly selected weaver ant is at most 5 mm long.
  
  
  
  
  
  
  
  
  
  
- e. What proportion of weaver ants are at most 11 mm long. Use the complement rule in the computation.
  
  
  
  
  
  
  
  
  
  
- f. What proportion of weaver ants are at least 4.5 mm long. Use the complement rule in the computation.
  
  
  
  
  
  
  
  
  
  
- g. What value separates the smallest 25% of weaver ants from the largest 75% of weaver ants?
  
  
  
  
  
  
  
  
  
  
- h. What value separates the largest 25% of weaver ants from the smallest 75% of weaver ants?

2. Lupe uses the following continuous probability distribution to answer questions about probability. Notice any errors she makes and tell her how to fix them.



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a. Find the proportion of data that is between 5 and 8.

$$P(5 < x < 8) = 0.096 + 0.14 + 0.14 + 0.079 = 0.455$$

b. Find the proportion of data that is at most 10.

$$P(x \leq 10) = 1 - P(0.005)$$

c. Find the proportion of data that is at least 4. Use the complement rule in the calculation.

$$P(x \geq 4) = 1 - 0.034 + 0.254 = 0.712$$

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