Homework Solutions
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Exercise 3

(a) (iii) More than 6.

(b) We can see that $\frac{1}{3}$ of the population is less than 6 and $\frac{2}{3}$ is greater than 6. So 6 is the 33rd percentile. Therefore, the median (50th percentile) is greater than 6.

(c) The area under the graph from 9 to 12. The shape is a trapezoid. To find the area of a trapezoid, you can take the average of the two parallel sides and multiply it by the distance between them. In this case, the parallel sides have lengths of $\frac{1}{9}$ (at 9) and $\frac{2}{9}$ (at 12). The average is $\frac{3}{18} = \frac{1}{6}$. Multiply this by the distance between 9 and 12: Area $= 3 \times \frac{1}{6} = \frac{1}{2}$.

Another way to find the area is to consider the triangle from 6 to 12 with the triangle from 6 to 9 removed. The big triangle has area $A = \frac{1}{2}bh = \frac{1}{2} \times 6 \times \frac{2}{9} = \frac{2}{3}$. The little triangle has area $A = \frac{1}{2}bh = \frac{1}{2} \times 3 \times \frac{1}{9} = \frac{1}{6}$. So the difference is $\frac{2}{3} - \frac{1}{6} = \frac{1}{2}$.