

**41** (a) When the fish hatches,  $x = 0$ . At this time the  $y$ -value is approximately 10 milligrams. After 6 weeks its weight is approximately 110 milligrams. After 12 weeks its weight is approximately 155 milligrams. These results could be expressed as  $f(0) \approx 10$ ,  $f(6) \approx 110$  and  $f(12) \approx 155$ . *Answers may vary slightly.*

(b) To compute these average rates of change, start by estimating the weight of a fish at 0, 6 and 12 weeks. These weights are approximately 10, 110, and 155 milligrams, respectively.

The average rates of change are calculated below.

$$\text{From 0 to 6: } \frac{f(6) - f(0)}{6 - 0} = \frac{110 - 10}{6 - 0} \approx 16.7$$

$$\text{From 6 to 12: } \frac{f(12) - f(6)}{12 - 6} = \frac{155 - 110}{12 - 6} = 7.5$$

These rates of change represents average weight increase per week. During the first six weeks, their weight is increasing by 16.7 milligrams per week, which is the larger of the two average