

Answers for class prep quiz on section 3.7, Stewart's Calculus (8th ed.)

1. **Answer:** (d). If $f(t)$ represents the position of an object, then $f'(t)$ is its velocity and $f''(t)$ is its acceleration.
2. **Answer:** (a). The average rate of growth of some population $p(t)$ over the period $a \leq t \leq b$ is $\frac{p(b) - p(a)}{b - a}$, i.e., average rate of growth is an average rate of change, not an instantaneous rate of change. As for the others:
 - If $Q(t)$ is the charge contained in a region of space, then $Q'(t)$ is the current coming into that region.
 - If $C(x)$ is the cost of producing x units of some good, then $C'(x)$ is the marginal cost of producing one more unit (approximately).
 - If $v(t)$ is the velocity of some object in motion, then $v'(t)$ is the acceleration of that object.
3. **Answer:** (d). The correct mathematical translation is: "Given $f(1) = 25,000$ and $f'(2) = 1,500$, find the value of $f(7)$."
4. **Answer:** (c). If $0 < P(t) < 1$, then $P(t) > 0$ and $1 - P(t) > 0$, so

$$\frac{dP}{dt} = .07P(t)(1 - P(t)) > 0,$$

so $P(t)$ will increase (as a function of time).