

General knowledge questions from the practice free-response (calculator active) test.

1. $F(t)$ is a rate of change. What is the total change of F on the interval from $t = a$ to $t = b$?
2. How can we **show** if $F(t)$ is increasing or decreasing?
3. What is the average value of F over the time interval $a \leq t \leq b$?
4. What is the average rate of change of F over the time interval $a \leq t \leq b$?

5. The graphs of $f(x)$ and $g(x)$ intersect at $x = a$ and $x = b$ (where $a < b$, and $f(x) > g(x)$). What is the area of the region enclosed by the graphs of f and g ?

6. Suppose the line $y = c$ is above the graphs of f and g . What is the volume of the solid generated when the region enclosed by the two graphs is revolved about the horizontal line $y = c$?

7. Let the region enclosed by the $f(x)$ and $g(x)$ be the base of a solid in the x - y plane. Write an integral expression for the volume of a solid whose base is the region described and whose cross-sections perpendicular to the region are squares.

8. Given $v(t)$, the velocity of a particle moving along the y -axis. How do we find the acceleration of the particle at $t = a$? What should we write?

9. How do we determine whether the **speed** of the particle is increasing or decreasing? What should we write to demonstrate our answer? What is our reason?

10. When asked for the time when the particle reaches its highest point are we looking for a relative (local) max or a absolute (global) max. How do we justify our answer?

11. When asked to find the position of the particle at a particular time, $t = a$, what do we have to consider? How do we find the position? How do we determine whether the particle is moving toward the origin or away from the origin? How do we justify our answer?