

Answers for class prep quiz on section 2.7, Stewart's Calculus (8th ed.)

1. **Answer:** (d). (d) is precisely the definition of $f'(-3)$. (b) is incorrect because it omits the limit. While (c) is a general formula for $f'(x)$, and (a) is the value of $f'(-3)$, neither is the definition.
2. **Answer:** (a). (a) is not a valid interpretation of $g'(7)$ because $g'(7)$ is a number (the SLOPE of the tangent line at $x = 7$), not an equation. The other three interpretations are valid.
3. **Answer:** (d). $f'(3)$ is the slope of the dashed line, which is rise/run = $(-1)/2$, as we can see by counting squares.
4. **Answer:** (c). Computing the limit of $\frac{[(7+h)^2 - 5] - [7^2 - 5]}{h}$ as $h \rightarrow 0$ gives a result of 14, which means that the slope of the tangent line at $x = 7$ is 14. The tangent line passes through the point $(7, 44)$, so the point-slope formula gives an equation of $(y - 44) = 14(x - 7)$. Note that (a) and (b) are incorrect because they are not the equation of a line; if you chose (a) or (b), chances are you computed that $f'(x) = 2x$ and didn't plug in $x = 7$ to get the slope of the tangent line at $x = 7$.