

Differentiation Quiz ... Set 2

11. a. Use the formal definition of the derivative to determine $f'(x)$ for $f(x) = \sqrt{x-1}$.
b. Determine the slope of the tangent to $f(x)$ at $(10, 3)$.
12. Determine the values of a , b , and c for $f(x) = ax^2 + bx + c$ so that $f'(x) = 6x - 3$ and $f(2) = -1$.
13. The population of a rabbits in a controlled system can be described by $P(x) = -x^2 + 18x + 19$, where x is the number of years after the population was first tracked.
 - a. What is the meaning of $P'(x)$ for this scenario?
 - b. $P'(11) = -4$. Explain what this means.
14. a. Determine the derivative of $f(x) = (x+1)^2(3x^2-5)^4$. Write your answer in simplified factored form.
b. Determine the value(s) of x for which the graph of $f(x)$ has a horizontal tangent.
15. a. Determine the point $(a, f(a))$ for which $f'(a) = a$, given that $f(x) = -x^2 + 3x - 7$.
b. Write the equation of the tangent to $f(x)$ at the point found in part a.
16. a. Determine $f'(x)$ if $f(x) = (8x^2 + x)^3$. Write your answer in simplified form.
b. Determine $f'\left(\frac{1}{2}\right)$.
17. a. Determine $\frac{dy}{dx}$ if $y = \sqrt{(3x^2 + 2)^3}$. Write your answer in simplified form.
b. State any values of x for which the function is not differentiable.
18. a. Differentiate $f(x) = \frac{(x+2)^3}{(x+3)(2x-1)}$. Simplify your answer.
b. State which rules of differentiation you used.