

power rule - tangent line quiz

Name: _____

Answers

1) Use the power rule to find the derivative of each function below. **Leave answers simplified and without negative exponents.**

a) $f(x) = \frac{1}{3x^3} + \frac{3}{\sqrt[3]{x}}$

$$f'(x) = -x^{-4} - x^{-\frac{2}{3}}$$

$$f(x) = \frac{1}{3}x^{-3} + 3x^{-\frac{1}{3}}$$

$$f'(x) = -\frac{3}{3}x^{-4} - \frac{3}{3}x^{-\frac{2}{3}}$$

b) $f(x) = 6\sqrt{x} + \frac{7x}{2}$

$$f'(x) = 3x^{-\frac{1}{2}} + \frac{7}{2}$$

$$f(x) = 6x^{\frac{1}{2}} + \frac{7}{2}x$$

$$f'(x) = 3x^{-\frac{1}{2}} + \frac{7}{2}$$

c) $f(x) = \frac{1-x}{2}$

$$f'(x) = -\frac{1}{2}$$

$$f(x) = \frac{1}{2} - \frac{1}{2}x$$

$$f'(x) = -\frac{1}{2}$$

2) Find the equation of the tangent line to function: $f(x) = \frac{1}{3}x^3 - x$ at $x = 3$.

find point: $f(3) = \frac{1}{3}(3)^3 - 3$
 $(3, 6) \qquad = 9 - 3 = 6$

find slope at $(3, 6)$

$$f'(x) = x^2 - 1$$

$$f'(3) = (3)^2 - 1 = 8$$

Equation of line

$$y - 6 = 8(x - 3)$$