

Derivative - Chain rule - Answers

For questions 1 – 6, Use the chain rule of derivative to find the derivative of the following functions.

1. $M(x) = (4x - 5)^2$ $M'(x) = 8(4x - 5)$

2. $f(t) = (1 - 3t)^4$ $f'(x) = -12(1 - 3t)^3$

3. $g(x) = \sqrt{3x - x^2}$ $g'(x) = \frac{(3-2x)}{2\sqrt{3x-x^2}}$

4. $y = \sqrt[3]{2x^3 - x^2}$ $\frac{dy}{dx} = \frac{(6x^2-2x)}{3\sqrt[3]{(2x^3-x^2)^2}}$

5. $T(w) = \frac{4}{\sqrt{1-2w}}$ $T'(w) = 4(1 - 2w)^{-\frac{3}{2}}$ or $\frac{4}{\sqrt{(1-2w)^3}}$

6. $h(y) = \frac{1}{(2y-1)^4}$ $h'(y) = -8(2y - 1)^{-5}$

7. Find the equation of the tangent line to $f(x) = (3x + 2)^6$ at $x = -1$

$$y = -18x - 17$$

8. Find the equation of the tangent line to $f(x) = \left(x + \frac{1}{x}\right)^3$ at $x = 1$

$$y = 8$$

9. Find the equation of the tangent line to $f(x) = \frac{4}{x+2\sqrt{x}}$ at $x = 4$

$$y = -\frac{3}{32}x + \frac{7}{8}$$