Chain Rule

Find the derivative of each function.

Formulas

$\frac{d}{dx}\left[\, f(g(x)) \,\right] = f'(g(x)) \cdot g'(x)$

$\frac{d}{dx}\left[\, u^n \,\right] = nu^{n-1} \cdot u'$

1. $f(x) = (3x - 4)^4$

2. $f(x) = (5x - 1)^6$

3. $f(x) = (x^2 + 5)^5$

4. $f(x) = (x + 6)^5$

5. $f(x) = (3x^2 - 5)^4$

6. $f(x) = \dfrac{1}{(3x + 5)^2}$

7. $f(x) = \sin(2x^2)$

8. $f(x) = \cos(2x + 3)$

9. $f(x) = (x^3 - 1)^4$

10. $f(x) = \sqrt{x^2 + 3}$

11. $f(x) = \sqrt{3x+5}$

12. $f(x) = \dfrac{1}{(x^2+1)^2}$

13. $f(x) = \cos(3x^3)$

14. $f(x) = \dfrac{1}{x^3+5}$

15. $f(x) = \sin^2(3x)$

16. $f(x) = \cos^3(x^2)$

17. $f(x) = \sqrt{\sin(x)}$

18. $f(x) = (4x^2-2)^{3/2}$

19. $f(x) = \sin(\sqrt{x}\,)$

20. $f(x) = \sin(\cos(x))$