

Derivatives

Compute $\frac{df}{dx}$ of following functions:

1. $f(x) = 5x^2 - 7x - 2$

2. $f(x) = 5(x^2 + 1) \cdot 2x$

3. $f(x) = 2 - \sqrt{x}$

4. $f(x) = \frac{6}{x^3}$

5. $f(x) = 2x - 3\sqrt[3]{x^2}$

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

7. $f(x) = 3^x + 2e^x$

8. $f(x) = \tan x + \sin x$

9. $f(x) = \frac{(x^2+2)^2}{4}$

10. $f(x) = (x + 1)^3$

Derivative of composed function

Compute $\frac{df}{dx}$ of following functions:

11. $f(x) = \tan(5x)$

12. $f(x) = \arctan(3x)$

13. $f(x) = e^{5x^2-2x+1}$

14. $f(x) = \ln(\ln x)$

15. $f(x) = e^{-\frac{1}{x^2}}$

16. $f(x) = \frac{1}{9-x^2}$

17. $f(x) = \sqrt{3x + \cos x}$

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

19. $f(x) = \ln(x + \sqrt{1 + x^2})$

20. $f(x) = \arctan(\sqrt{x})$

Derivative of multiplication

Compute $\frac{df}{dx}$ of following functions:

21. $f(x) = x \ln x$

22. $f(x) = x^2 \cos x$

23. $f(x) = (x + 1)(x + 5)^8$

24. $f(x) = (x - 2)\sqrt[3]{x^2 - 4}$

25. $f(x) = (x^3 + 2)e^{4x}$

26. $f(x) = (x + 6)\sqrt{x + 1}$

Derivative of division

Compute $\frac{df}{dx}$ of following functions:

27. $f(x) = \frac{x+1}{x-1}$

28. $f(x) = \frac{x^4+3}{3x}$

29. $f(x) = \frac{x+2}{\sqrt{5-x}}$

30. $f(x) = \frac{x^2+3}{x+5}$