Product Rule

Find the derivative of each function.

Formulas

$\frac{d}{dx}[\,fg\,] = f'g + fg'$ $\qquad$ $(\text{first})' \cdot (\text{second}) + (\text{first}) \cdot (\text{second})'$

1. $f(x) = (x^2 + 1)(x - 3)$

2. $f(x) = (x + 1)(2x - 6)$

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

4. $f(x) = (2x^2 + 2)(x^2 - x)$

5. $f(x) = (x^2 + 3x + 3)(x - 1)$

6. $f(x) = (3x - 3)(x^3 + 1)$

7. $f(x) = x^4 \sin(x)$

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

9. $f(x) = x^4 e^x$

10. $f(x) = x^3 \ln(x)$

11. $f(x) = 3x^2\, e^x$

12. $f(x) = (x+2)\, e^x$

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

14. $f(x) = x^3 \tan(x)$

15. $f(x) = x^4\, e^{5x}$

16. $f(x) = x^4 \sin(2x)$

17. $f(x) = e^x \sin(x)$

18. $f(x) = (x^2+2)\, e^{2x}$

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

20. $f(x) = \cos(x)\, e^{2x}$