Derivatives with Product Rule

Use the product rule to differentiate the following.

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

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

3. $f(x) = (5x + 8)(2x - 7)$

4. $f(x) = (3x + 8)(4x + 5)$

5. $f(x) = (x^2 - 4)(x - 8)$

6. $f(x) = (x^2 + 4)(x + 8)$

7. $f(x) = (3x^2 + 1)(2x + 7)$

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

9. $f(x) = (5x^3 - 3x)(x^2 - 2x + 9)$

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

11. $f(x) = (7x^4 + 5x^3)(x^2 - 5x + 6)$

12. $f(x) = (6x^4 + 7x^3)(3x^2 - 7)$

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

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

15. $f(x) = (5x^4 - 6x)(7x^2 + 1)$

16. $f(x) = (8x^4 - 3x)(5x^2 + 1)$

17. $f(x) = \sqrt{x}(7x - 4)$

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

19. $f(x) = (4\sqrt{x} - 3x)(x^2 + 5)$

20. $f(x) = (9\sqrt{x} + 2x)(x^2 + 3)$

21. $f(x) = \left(\sqrt[5]{x^4} - x + 1\right)\left(5x - \sqrt[3]{x}\right)$

22. $f(x) = \left(\sqrt[5]{x^4} - 3x + 5\right)\left(2x + \sqrt[3]{x}\right)$