Name:

Differentiate the following functions:-

1. $f(x) = x^2(2 - x)$ (Hint: Use Product Rue)

2. $f(x) = \dfrac{x^2 + 4x + 3}{\sqrt{x}}$ (Hint: Use Quotient Rule)

3. $f(x) = \dfrac{\sqrt{x}}{2 + x}$ (Hint: Use Quotient Rule)

4. $f(x) = \left(\dfrac{1 + 2x}{3 - 4x}\right)^{100}$ (Hint: Use Chain Rule and Quotient Rule)

5. $f(x) = x \cos x + 2 \cot x$ (Hint: Use Product Rule for $x \cos x$)

6. $f(x) = \dfrac{x}{2 - \tan x}$ (Hint: Use Quotient Rule)

7. $f(x) = \left(\dfrac{\cos x}{1 - \sin x}\right)^{50}$ (Hint: Use Chain Rule and Quotient Rule)

8. $f(x) = x^2 \sin x \tan x$ (Hint: Use Product Rule Twice)

9. $f(x) = \sqrt{\dfrac{\tan x - 1}{\sec x}}$ (Hint: Use Chain Rule and Quotient Rule)

10. $f(x) = \left(x + \sqrt{x}\right)^{100}$ (Hint: Use Chain Rule)

11. $f(x) = \sin(x + \cos \sqrt{x})$ (Hint: Use Chain Rule Twice)

12. $f(x) = \sqrt{\dfrac{1 + \sin x}{1 + \cos x}}$ (Hint: Use Chain Rule and Quotient Rule)