Books and notes (in any form) are not allowed allowed. You may use the given formula sheet and calculator, **but you must show all your work**.

1. (4 pts) Find the derivative of $f(x) = (x^2 - 4x^3 + 3x)(5x^4 + 6x^2 - 2x)$. [Do not simplify.]

2. (4 pts) Find $\dfrac{ds}{dt}$ for $s = \dfrac{5 - 3t^3 + 4t}{3t^2 + 5t}$. [Do not simplify.]

3. (4 pts) Find the ***slope*** of the tangent line to graph of $y = \sqrt{3x + 4}$ at $x = 7$.

4. (8 pts) Given $f(x) = (2x^2 + 1)^8$.

(a). Find $f'(x)$ and simplify.

(b). Find $f''(x)$.   [Do not simplify.]