

Derivative of $(x^{10} + 8x)^6$

How do you take the derivative of $(x^{10} + 8x)^6$?

One thing you *don't* do is expand the expression by multiplying $(x^{10} + 8x)$ by itself repeatedly. Instead, we use the chain rule:

$$\frac{d}{dx}(x^{10} + 8x)^6 = 6(x^{10} + 8x)^5(10x^9 + 8)$$

Question: What form should we leave our answers in?

Answer: That's a very important question. If a computer answers a question with 500 million pages of printout, that answer is useless. If for some reason you need your answer in polynomial form you may have to expand $(x^{10} + 8x)^6$ after all. For the exam you may leave your answer in any form as long as it's correct. In particular, it's best not to try to simplify your answer unless you're specifically instructed to.

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