NAME: _____

1. If f is a differentiable function, find an expression for the derivative of $y = x^7 f(x)$.

Select the correct answer.

a. $\frac{d}{dx}\left(x^7 f(x)\right) = 7x^6 f(x) + x^7 f'(x)$

b. $\frac{d}{dx}\left(x^7 f(x)\right) = 7x^7 f(x) + x^6 f'(x)$

c. $\frac{d}{dx}\left(x^7 f(x)\right) = 7x^6 f(x) - x^7 f'(x)$

d. $\frac{d}{dx}\left(x^7 f(x)\right) = 7x^7 f(x) - x^6 f'(x)$

e. $\frac{d}{dx}\left(x^7 f(x)\right) = 6x^6 f(x) - x^7 f'(x)$

2. Find the given derivative by finding the first few derivatives and observing the pattern that occurs.

$\frac{d^{99}}{dx^{99}}(\sin x) = -\cos x$

3. Differentiate the function.

$f(t) = (t + t^{-1})^3 = 3(t^2+1)\left(\frac{t^2-1}{t^4}\right)$

$\frac{d}{dx}\left[t^3 + 3t^2 t^{-1} + 3t t^{-2} + t^{-3}\right]$

power rule

Product rule

Product rule

power rule