CHAPTER 4

section 4.2

4) $y' = 2x^9 + 1$

25) $\dfrac{d}{dx}(fg) \mid_{x=-2} = 24$

$\dfrac{d}{dx}\left(\dfrac{f}{g}\right) \mid_{x=-2} = \dfrac{18}{49}$

$\dfrac{d}{dx}\left(\dfrac{g}{f}\right) \mid_{x=-2} = -18$

$\dfrac{d}{dx}(2f - 3g) \mid_{x=-2} = -3$

section 4.4

20) $y'' = \dfrac{2}{x^3}$

section 4.5

10) $y' = \dfrac{5}{4}\sec^{\frac{5}{4}}(x+5)\tan(x+5)$

19) using the logarithmic differentiation

$$y' = \left(\frac{x^2-1}{x^3+1}\right)^4 \left(\frac{8x}{x^2-1} - \frac{12x^2}{x^3+1}\right)$$

using chain rule and quotient rule

$$y' = 4\left(\frac{x^2-1}{x^3+1}\right)^3 \left(\frac{-x^4+3x^2+2x}{(x^3+1)^2}\right)$$

$$= \frac{4(x^2-1)^3\left(-x^4+3x^2+2x\right)}{(x^3+1)^5}$$

section 4.6

25) The equation of the tangent line is

$$y = 4x + 8$$

The equation of the normal line is

$$y = \frac{-1}{4}x + \frac{15}{4}$$

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section 4.7

20) $y' = x^x \left(1 + \ln x\right)$

21) $y' = \left(\dfrac{\sin^2 x \ \tan^4 x}{\left(x^2+1\right)^2}\right)\left(2\cot x + 4\cot x \ \sec^2 x - \dfrac{4x}{x^2+1}\right)$

24) $y' = x^{\cos x}\left(\dfrac{\cos x - x \ \ln x \ \sin x}{x}\right)$

26) $y' = (\sin x)^x \left(x\cot x + \ln\left(\sin x\right)\right)$
