Use the power rule to calculate the derivatives of the following power functions. You may need to rewrite the problems as painfully obvious power functions first.

Power Rule for derivatives:

$$\text{If } f(x) = a \cdot x^n, \quad f'(x) = \frac{df}{dx} = a \cdot n \cdot x^{n-1} \quad \text{OR} \quad \frac{d}{dx} a x^n = a \cdot n x^{n-1}$$

$$\frac{d}{dx} 5x^4 = 20x^3 \qquad\qquad \frac{d^2}{dx^2} 5x^4 = \frac{d}{dx} 20x^3 = 60x^2$$

$$\frac{d}{dx} 7x^3 = \qquad\qquad\qquad \frac{d^2}{dx^2} 7x^3 =$$

$$\frac{d}{dx} 8x^7 = \qquad\qquad\qquad \frac{d^2}{dx^2} 8x^7 =$$

$$\frac{d}{dx} -3x^4 = \qquad\qquad\qquad \frac{d^2}{dx^2} -3x^4 =$$

$$\frac{d}{dx} 6x^{1/2} = \qquad\qquad\qquad \frac{d^2}{dx^2} 6x^{1/2} =$$

$$\frac{d}{dx} 7x^{3/4} = \qquad\qquad\qquad \frac{d^2}{dx^2} 7x^{3/4} =$$

$$\frac{d}{dx} \frac{1}{2} x^{-3/4} = \qquad\qquad\qquad \frac{d^2}{dx^2} \frac{1}{2} x^{-3/4} =$$

$$\frac{d}{dx} 4x^{7/4} = \qquad\qquad\qquad \frac{d^2}{dx^2} 4x^{7/4} =$$

$$\frac{d}{dx} x^{1.4} = \qquad\qquad\qquad \frac{d^2}{dx^2} x^{1.4} =$$

$$\frac{d}{dx} 2x^{0.3} = \qquad\qquad\qquad \frac{d^2}{dx^2} 2x^{0.3} =$$

$$\frac{d}{dx} 1.7x^2 = \qquad\qquad\qquad \frac{d^2}{dx^2} 1.7x^2 =$$

$$\frac{d}{dx} \sqrt{x^3} = \frac{d}{dx} x^{3/2} = \frac{3}{2} x^{1/2}$$

$$\frac{d}{dx} \sqrt[4]{x} =$$

$$\frac{d}{dx} \sqrt[5]{x^2} =$$

$$\frac{d}{dx} \sqrt{x} =$$

$$\frac{d}{dx} \sqrt[3]{x} =$$

$$\frac{d}{dx} \sqrt{x^5} =$$

$$\frac{d}{dx} \sqrt[3]{x^2} =$$

$$\frac{d}{dx} \sqrt[7]{x^2} =$$

$$\frac{d}{dx} \sqrt[4]{x^3} =$$

$$\frac{d}{dx} \sqrt[4]{x^5} =$$

$$\frac{d}{dx} \sqrt[6]{x^5} =$$

$$\frac{d}{dx} 7 \cdot \sqrt[4]{x^9} =$$

$$\frac{d}{dx} \frac{1}{\sqrt{x^3}} = \frac{d}{dx} x^{-3/2} = -\frac{3}{2} x^{-5/2}$$

$$\frac{d}{dx} \frac{1}{\sqrt[4]{x}} =$$

$$\frac{d}{dx} \frac{1}{\sqrt[5]{x^2}} =$$

$$\frac{d}{dx} \frac{1}{\sqrt{x}} =$$

$$\frac{d}{dx} \frac{1}{\sqrt[3]{x}} =$$

$$\frac{d}{dx} \frac{1}{\sqrt{x^5}} =$$

$$\frac{d}{dx} \frac{1}{\sqrt[3]{x^2}} =$$

$$\frac{d}{dx} \frac{1}{\sqrt[5]{x^3}} =$$

$$\frac{d}{dx} \frac{1}{\sqrt[4]{x^3}} =$$

$$\frac{d}{dx} \frac{1}{\sqrt[4]{x^5}} =$$