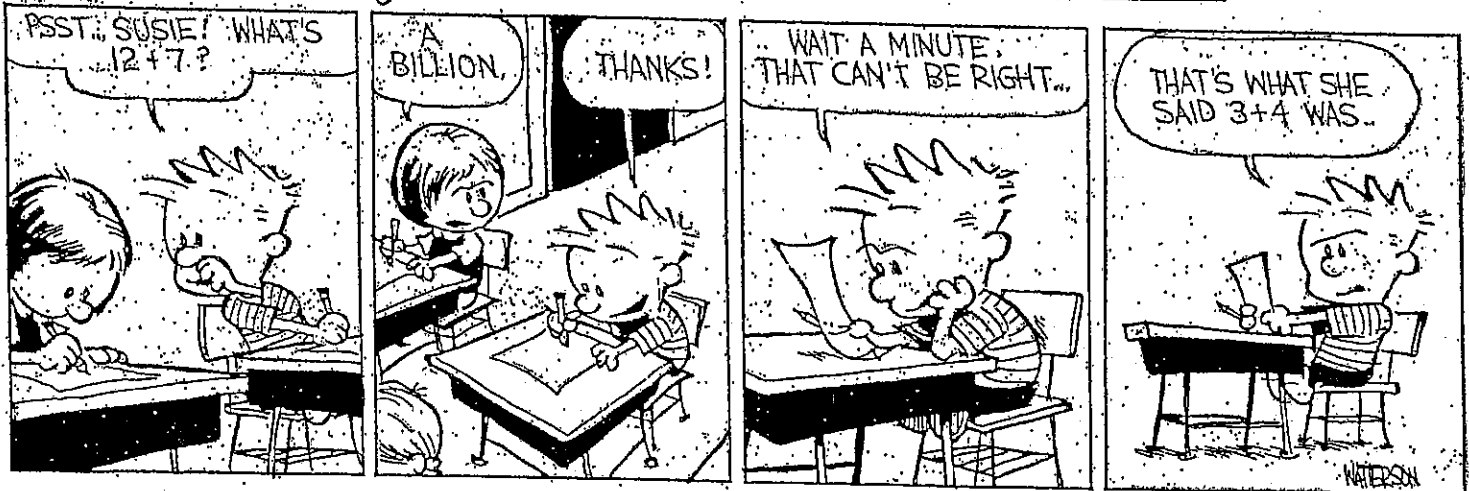


Math 2 Winter 2006 Quiz 5

Name: Key

Section: \_\_\_\_\_



1. Find  $\frac{d}{dx}(\log_2(\pi x^6))$ .

$$\frac{1}{\pi x^6} \cdot \frac{1}{\ln(2)} \cdot (\pi x^6)'$$

$$= \frac{6\pi x^5}{\ln(2) \cdot \pi x^6}$$

$$\boxed{\frac{6}{\ln(2) x}}$$

2. Find  $\frac{d}{dx}(\tan^{-1}(\ln(x)))$ .

$$\frac{1}{1+(\ln(x))^2} \cdot (\ln(x))' = \frac{1}{1+(\ln(x))^2} \cdot \frac{1}{x}$$

$$\boxed{\frac{1}{(1+(\ln(x))^2) x}}$$

3. Evaluate  $\int x^2 \cdot 4^{x^3} dx$ .

$$u = x^3$$
$$\frac{du}{3} = \frac{3x^2 dx}{3}$$

$$\frac{1}{3} \int 4^u du = \frac{4^u}{\ln(4)} \cdot \frac{1}{3} + C$$

$$\boxed{\frac{4^{x^3}}{3 \ln(4)} + C}$$

4. Evaluate  $\int \frac{e^{3x}}{\sqrt{36 - e^{6x}}} dx$ .

$$\int \frac{e^{3x}}{\sqrt{36 - (e^{3x})^2}} dx = \frac{1}{3} \int \frac{du}{\sqrt{6^2 - u^2}} = \frac{1}{3} \sin^{-1} \left( \frac{u}{6} \right) + C$$

$$u = e^{3x}$$

$$du = 3e^{3x} dx$$

$$\boxed{\frac{1}{3} \sin^{-1} \left( \frac{e^{3x}}{6} \right) + C}$$