

5.1 - 5.4 quiz

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1 Bleh

1.

$$\frac{dy}{dx}(\ln(\ln x^{12})) \quad (1)$$

$$= \frac{1}{\ln(x^{12})} \frac{d}{dx}(\ln(x^{12})) \quad (2)$$

$$= \frac{1}{\ln(x^{12})} \cdot \frac{12}{x} \quad (3)$$

$$= \frac{12}{x \ln(x^{12})} \quad (4)$$

2.x-coordinate(s) of any relative extrema and inflection points of the function $y = x^5 \ln(\frac{x}{9})$.

3.The relationship between the number of decibels β and the intensity I of sound in watts per centimeter squared is $\beta = 10 \log_{10} (\frac{I}{10^{-16}})$ Determine the number of decibels of a sound with an intensity of 10^{-9} watts per square centimeter.

$$\beta = 10 \log_{10} \left(\frac{I}{10^{-16}} \right) \quad (1)$$

$$= \frac{10}{\ln 10} (\ln I + 16 \ln 10) \quad (2)$$

$$= 160 + 10 \log_{10} I \quad (3)$$

$$\beta(10^{-10}) = \frac{10}{\ln 10} (\ln 10^{-9} + 16 \ln 10) \quad (4)$$

$$= \frac{10}{\ln 10} (-9 \ln 10 + 16 \ln 10) \quad (5)$$

$$= \frac{10}{\ln 10} (7 \ln 10) \quad (6)$$

$$= 70 \text{ decibels} \quad (7)$$

4.

$$\int \frac{x^2 + 16x + 6}{x^3 + 24x^2 + 18x - 1} dx, \quad u = x^3 + 24x^2 + 18x - 1, \quad \frac{du}{3} = \frac{3x^2 + 48x + 18 - 1dx}{3} = x^2 + 16 + 6dx \quad (1)$$

$$= \int \frac{1}{u} \frac{du}{3} \quad (2)$$

$$= \frac{1}{3} \int \frac{1}{u} du = \ln|u| + C \quad (3)$$

5.

$$df \quad (1)$$

5.

$$df \tag{1}$$

7. Use the Horizontal Line Test to determine whether the following statement is true or false. The function is one-to-one on its entire domain and therefore has an inverse function.

True.

9.

$$f(x) = x + 2, \quad g(x) = 4x - 7 \tag{1}$$

$$(g^{-1} \cdot f^{-1})(x) \tag{2}$$

$$= \tag{3}$$

10.

$$y = x^5 e^{x^9} \tag{1}$$

$$\frac{dy}{dx} = \tag{2}$$

12.

$$\int_1^7 \frac{e^{\sqrt[7]{x}}}{\sqrt{x}} dx, \quad u = \sqrt[7]{x}, \quad du = \frac{7}{2\sqrt{x}} dx \tag{1}$$

$$\tag{2}$$