

Quiz 3 Solutions

Lessons 7 and 8

Problem 1

$$f(x) = x^7 + \cos x - \frac{2}{\sqrt[3]{x}}$$

$$= x^7 + \cos x - 2x^{-1/3}$$

$$-\frac{1}{3} - \frac{3}{3} = -\frac{4}{3}$$

$$f'(x) = 7x^6 - \sin x - 2\left(-\frac{1}{3}x^{-1/3-1}\right)$$

$$= \boxed{7x^6 - \sin x + \frac{2}{3}x^{-4/3}}$$

$$\text{or } \frac{1}{\sqrt[3]{x^4}}$$

Problem 2 The population of a herd of Jackalope over time (in years) is given by

$$f(x) = 4x^3 - 6x^2 + 7$$

If $x=0$ corresponds to 2010, what two years is the growth rate of the population 0?

$$f'(x) = 12x^2 - 12x = 0$$

derivative is growth rate,
set equal to 0

$$12x(x-1) = 0$$

$$x = 0$$

$$2010$$

$$x = 1$$

$$2011$$