



Examples 3.3 – Composite Functions

1. Suppose that the population of a town is $g(x) = 400x^2 + 2500$ people, where x is years after 2000, and that $f(g) = \sqrt{g}$ is the level of CO₂ pollution in the air in parts per million, where g is the population.

(a) Complete the table of data.

Solution:

x	$g(x) = 400x^2 + 2500$	$f(g(x)) = \sqrt{g(x)}$
2		
5		

- (b) Write down a model (with units) that represents the CO₂ level as a function of time. Find the rate of change model (with units), and then find how quickly the CO₂ level was changing in 2007.

Solution:

2. Find the derivative of each of the following:

Solution:

(a) $y = (x^2 - 3x)^5$

(b) $y = (f(x))^5$

(c) $y = (1 - 20x + 100x^4)^{1/3}$

(d) $y = \frac{7}{6}(x^3 - 2x)^{-1/5}$