

**MATH 101
HOMEWORK 3**

Turn in by 18 March 2004 Thursday class hour.

1. Find $f'(x)$ where $f(x) = \tan(\cos^2(x + \sec x) - x^3 + 1)$.
2. Find $f'(x)$ where $f(u) = \frac{1}{u}$, $u(t) = t^2 + \cos t$, $t(x) = (1 + 3x)^9$.
3. Find $f'(x)$ where $f(x) = (\sec(x^2 + \tan x) + x^5)^2 (x^2 + x + 1)^3$.
4. $x(t) = t^2 + \cos t$, $y(t) = t + \sin t$. Find $\frac{dy}{dx}$.
5. $x(t) = t^2 + t - \tan t$, $y(t) = t^3 + \cot t$. Find $\frac{dy}{dx}$.
6. $x(t) = 3 \cos t$, $y(t) = 5 \sin t$. Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$.
7. If $x^2 + 3xy + y^2 = 10$, then find $\frac{dy}{dx}$.
8. If $y \cos x + x \sin y = 8$, then find $\frac{dy}{dx}$.
9. If $x^7 + xy + y^7 = 3$, then find $\frac{dy}{dx}$ and $\frac{dy}{dx}(1, 1)$.
10. If $\tan(xy) + 1 = 0$, then find $\frac{dy}{dx}$ and $\frac{dy}{dx}(-4, \pi/16)$.

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