SAMPLE FINAL

1. $\frac{dy}{dx} = \frac{2x^3}{\sqrt{x^4+1}}$

2. $\ln(2t) + 1$

3. $f'(x) = \cos\left(\frac{2}{x}\right) \cdot \left(\frac{-2}{x^2}\right)$

4. $\frac{dy}{dt} = 2e^{2t} - 2\sec^2 2t$

5. $\frac{1}{12}\left(2x^4+1\right)^{3/2} + C$

6. $\frac{1}{2}\ln\left(x^2+1\right) + C$

7. 2

8. $-63 + \frac{1}{3} = \frac{-188}{3}$

9. $\frac{dy}{dx} = \frac{-5x^4 - 2xy^3}{3x^2y^2 + 2y}$

10. a) $f'(x) = \lim_{h\to 0} \frac{f(x+h) - f(x)}{h}$

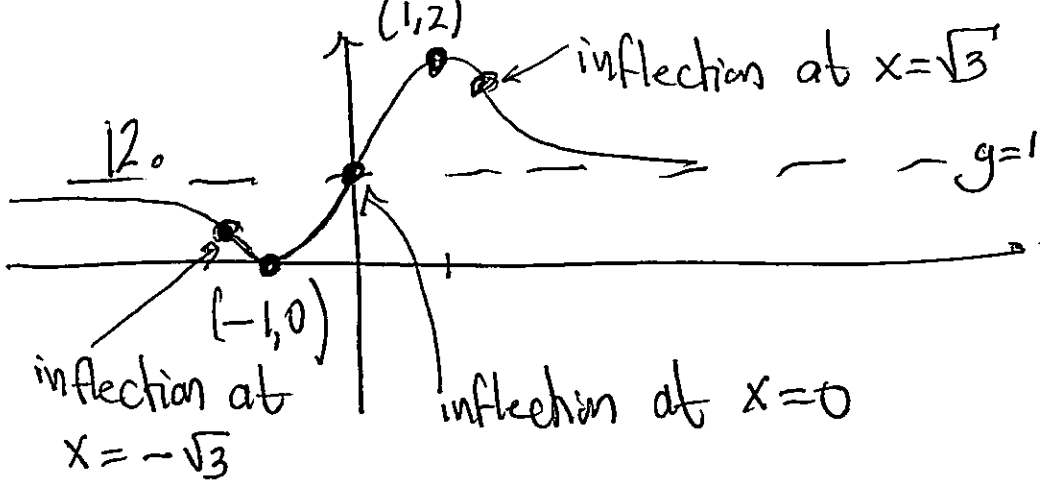
$= \lim_{h\to 0} \frac{-(x+h)^2 + x^2}{h} = \lim_{h\to 0} \frac{-2xh - h^2}{h}$

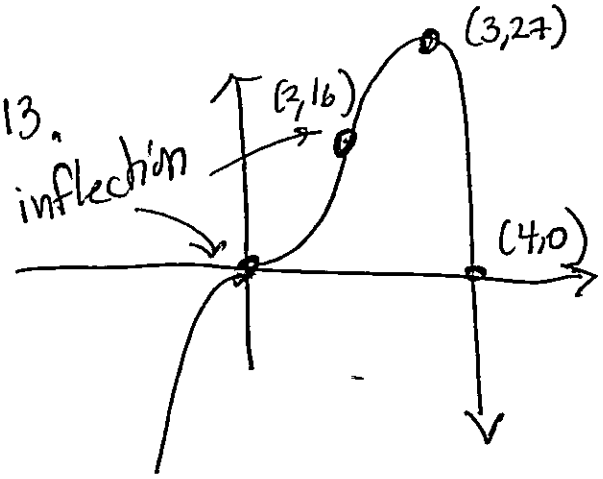
$= -2x$

10b) $y + 3 = -4(x-2)$

11. 9/2

12.



13. 

14. ~~1/5~~ $\frac{1}{20}$

$f(x) = \sqrt{x}$

15. $f(4.01) = f(4) + f'(4)(4.01 - 4)$

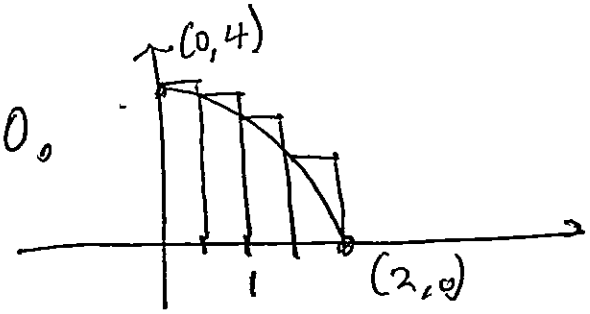
$= 2 + \frac{1}{4}(.01) = 2.0025$

16. -3

17. MAX 10e
MIN 0

18. ~~12in~~ $128\ in^3$

19. $\frac{dy}{dx} = 3x^2 \cos(x^6)$

20. 

$\int_0^2 (4 - x^2)\,dx \approx \frac{1}{2}\left(4 + \frac{15}{4} + 3 + \frac{7}{4}\right) = \frac{25}{4}$

21. $-40\ m^2/sec.$