Midterm 1 for Math 222, Lecture , Fall 2013

Ti.

Your TA and Discussion (circle one):

Name

Total Score:

Problem 1 (15 pts): _____

Problem 2 (20 pts): _____

Problem 3 (20 pts): __________

Problem 4 (15 pts): _____

Problem 6 (15 pts): _____

CAUTION: No calculators are allowed. If you have question about the problems, please contact the proctor as soon as possible.

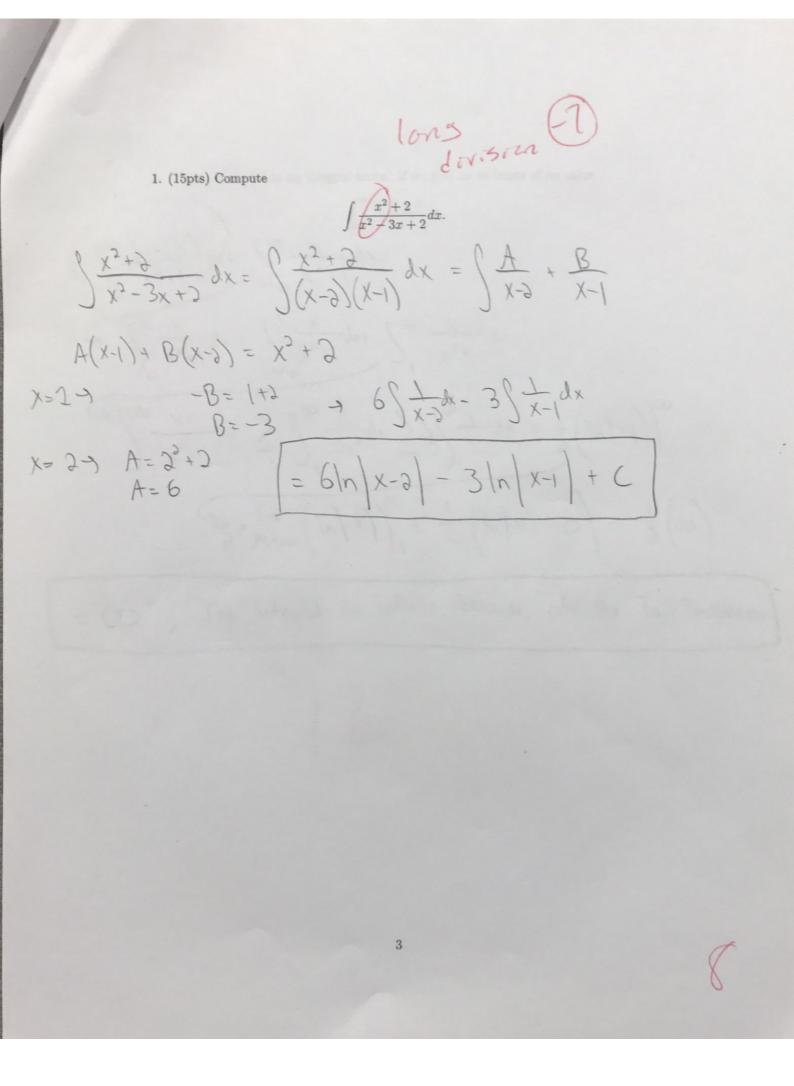
Formula Sheet

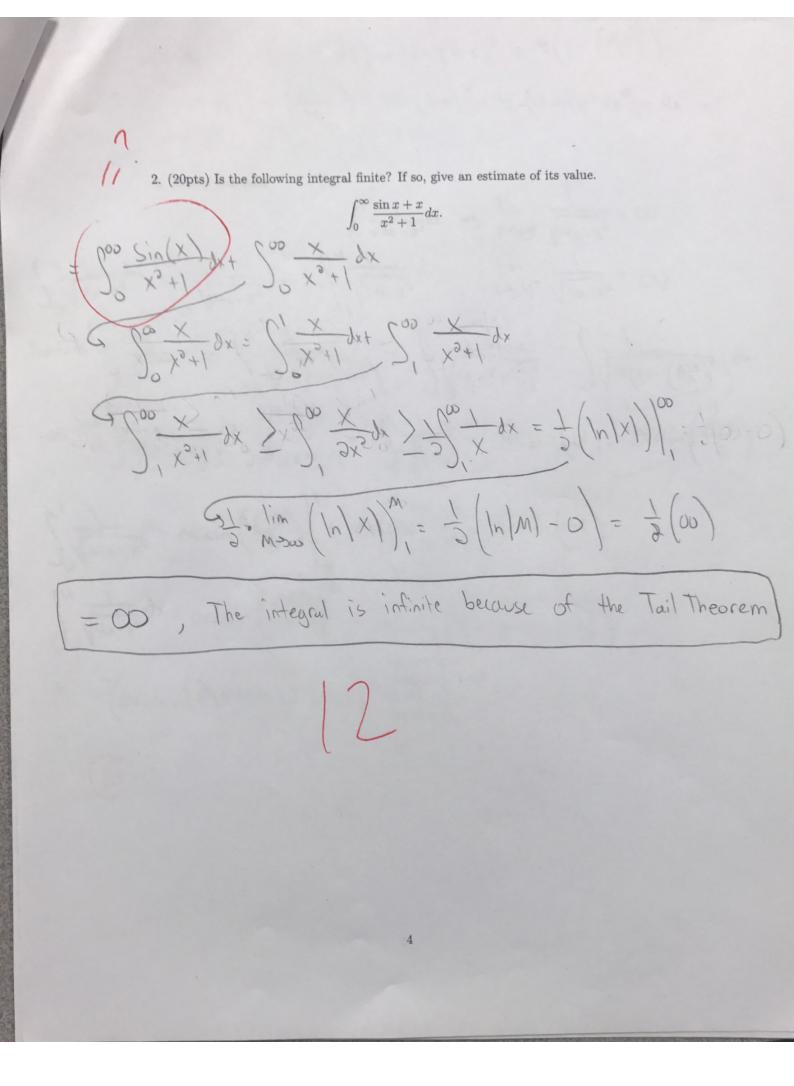
$$2\sin A \sin B = \cos(A - B) - \cos(A + B)$$

$$2\cos A \cos B = \cos(A - B) + \cos(A + B)$$

$$2\sin A \cos B = \sin(A + B) + \sin(A - B).$$

$$\begin{split} &\int \frac{du}{\sqrt{1-u^2}} = \arcsin u + C, \\ &\int \sqrt{1-u^2} du = \frac{1}{2} u \sqrt{1-u^2} + \frac{1}{2} \arcsin u + C, \\ &\int \frac{du}{\sqrt{1+u^2}} = \log(u + \sqrt{1+u^2}) + C, \\ &\int \sqrt{1+u^2} du = \frac{1}{2} u \sqrt{1+u^2} + \frac{1}{2} \log(u + \sqrt{1+u^2}) + C, \\ &\int \frac{du}{\sqrt{u^2-1}} = \log(u + \sqrt{u^2-1}) + C, \\ &\int \sqrt{u^2-1} du = \frac{1}{2} u \sqrt{u^2-1} - \frac{1}{2} \log(u + \sqrt{u^2-1}) + C. \end{split}$$





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$$= 4 (1 - (\frac{3}{3})^{3}) = 4 - (3 - x)^{3} = 4 - (4 - 4x^{3} + x^{3}) = 4x^{3} - x^{3}$$

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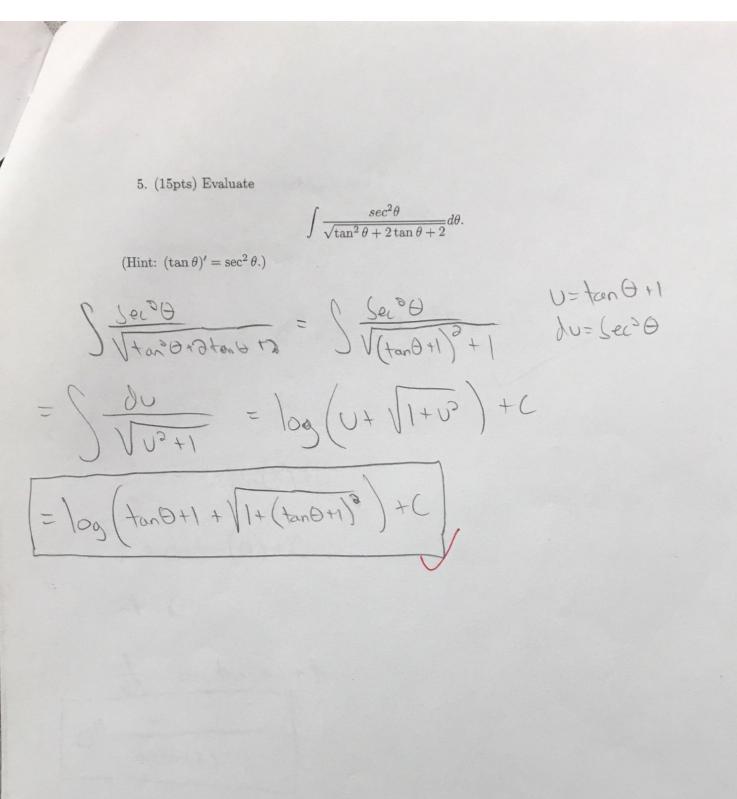
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4. (15pts) Compute $\int x^2 \sin(3x) dx.$ $\int x^2 \sin(3x) dx.$ $= -x^{2} (\omega_{5}(3x) + \frac{3}{3}) \times (\omega_{5}(3x) dx dy = dx df = (\omega_{5}(3x) dx dy = dx dy =$ $= \frac{-x^2 (os(3x))}{3} + \frac{3}{3} \left(\frac{x sih(3x)}{3} - \frac{11}{3} sih(3x) dx \right)$ = -x260(3x) + 2x5in(3x) + 2605(3x)



6. (15pts) Solve the differential equation

$$(1+x^2)y'=e^y,$$

with initial value y(0) = 0.

$$\frac{(1+x^3)y'=e^y}{dy'=\frac{e^y}{1+x^3}} \rightarrow e^y \neq 0 \text{ (no Solutions lost)}$$

$$\frac{dy}{dx} = \frac{e^y}{1+x^3} \rightarrow e^y \neq 0 \text{ (no Solutions lost)}$$

$$\frac{-1}{e^{s}} = \arctan(x) + C$$

$$\frac{-1}{e^{o}} = \arctan(o) + C$$

$$-1 = C$$

$$\frac{-1}{e^{x}} = \arctan(x) - 1$$

$$e^{x} = \frac{-1}{\arctan(x) - 1}$$