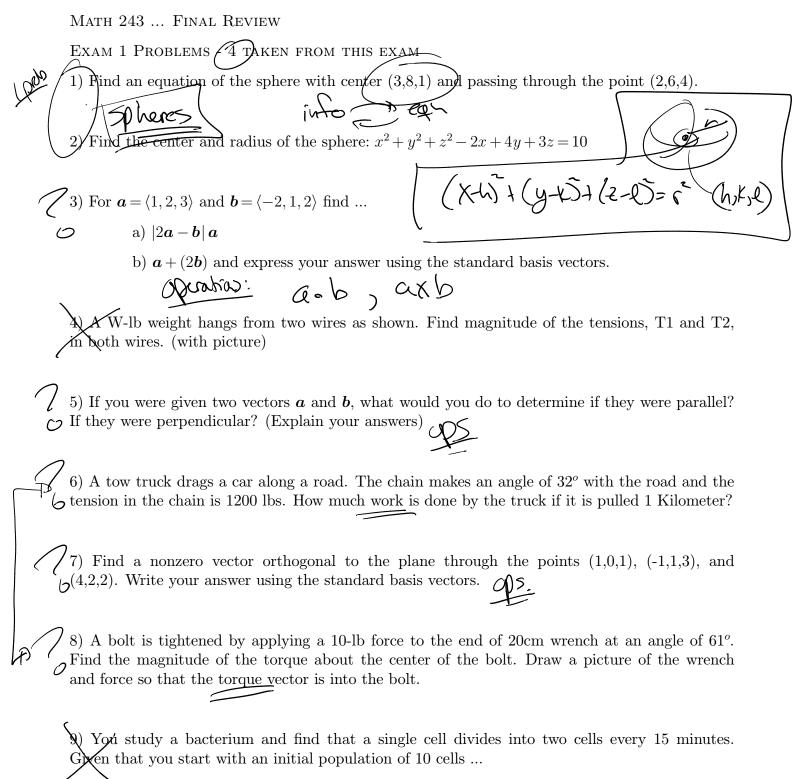
Mah Z43 Fial Review 16 probs @ 10pts each P 140pts = 100% Exanl - T ("take) 4 problems (rex) (X + Sin(N) (os(x) dx (in an exam) "tak" is () exact copy? J? (X + 52 x cosx dx or () Smill drayo? J? (X + 52 x cosx dx as () Same concepts? Zy Seex tanx + x J3x71 dx Exanz -> 4 probes Exan3 - Y parts Exand - 4 pobs



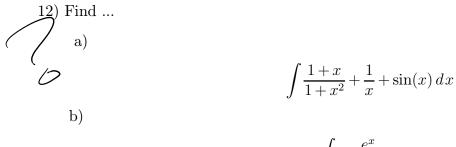
a) Find the growth rate (use hours for the unit of time).

b) Find an expression for the number of cells after t hours.

10) When you take a cold drink from a refrigerator, its temperature is  $34^{\circ}$  F. After 18 minutes in a  $72^{\circ}$  F room the drink's temperature has increased to  $45^{\circ}$  F. What is it's temperature if you wait an additional 14 minutes? When will it's temperature be  $67^{\circ}$  F?

11) Perform the following ...

a) Prove that 
$$\frac{d}{dx}(\sec^{-1}(x)) = \frac{1}{x\sqrt{x^2-1}}$$
  
(b) Differentiate  $f(t) = \ln(t)\sqrt{\arcsin(2t^2+3)}$ 



$$\int \frac{e^x}{\sqrt{1 - e^{2x}}} \, dx$$

13 Prove that 
$$\frac{d}{dx}(\cosh^{-1}(x)) = \frac{1}{\sqrt{x^2 - 1}}$$

14) Find ...

 $\mathcal{O}$ 

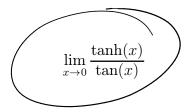
a) the derivative of  $x \tanh^{-1}(x) + \ln\sqrt{1-x^2}$ b) the integral

$$\int \frac{\cosh x}{\cosh^2 x - 1} dx$$

15) Find the limit



 $\mathcal{Z}_{\mathcal{O}}^{(16)}$  Find the limit



EXAM 2 PROBLEMS - 4 TAKEN FROM THIS EXAM 1) Use substitution and integration by parts to evaluate the given integral.  $\int e^{\sin(t)} \sin(t) \cos(t) dt$  (2) Evaluate the given trigonometric integral.  $\int \sin^7(x) \cos^5(x) \, dx$ 

3) Use trigonometric substitution to evaluate the given integral.

$$\int x^3 \sqrt{1-x^2} \, dx$$

4) Use partial fractions to evaluate the given integral.  $\int \frac{x^2 + x + 1}{x^3 + x} dx$ 5 Evaluate the given integral.  $\int \frac{\tan^3(x)}{\cos^3(x)} dx$ 

 $\begin{array}{c} \begin{array}{c} & & \\$ 

7) Use substitution and the given table to evaluate the integral. (includes image of table)  $\int \frac{1}{\sqrt{e^{2x} - 3}} dx$ 

8) Setup the solutions for the left endpoint approximation and the simpson approximation to find the area of a pool that is 30 feet long and you took 11 width measurements of 0 ft, 5 ft, 10 ft, 12 ft, 15 ft, 12 ft, 10 ft, 10 ft, 12 ft, 6 ft, and 0 ft that were equally spaced along the length of the pool.

9) Find the arc length of the curve:  $y = e^x$ ,  $-\infty \le x \le 0$ . (Hint: Use the table of integrals given early in the exam)

10) Setup, but do not integrate, an integrals to find the area of the surface and the volume generated by rotating the curve  $y = e^{-2x}$ ,  $0 \le x \le \infty$ , about the x-axis.

11) A trough is filled with a liquid of density  $10 \text{ lb}/\text{ft}^3$ . The ends of the trough are equilateral triangles with sides 10ft long and vertex at the bottom. Setup, but do not integrate, the integral to find the hydrostatic force on one end of the trough.

EXAM 3 Problems - 4 taken from this exam

EXAM 4 PROBLEMS - 4 TAKEN FROM THIS EXAM

(7) Determine whether the sequence converges or diverges. If it converges, find the limit. a)  $a_n = \sqrt{3n+2}/\sqrt{n-4}$ 

a) 
$$a_n = \sqrt{3n+2} / \sqrt{n-4}$$
  
b)  $a_n = 3^n 7^{-n}$ 

c)  $a_n = \ln(n) / \ln(2n)$ 

(2) Show that the geometric series  $a + ar + ar^2 + ar^3 + ... = a/(1-r)$  when |r| < 1.

 $\begin{pmatrix} 3 \\ 0 \end{pmatrix}$  Find the sum of the telescoping series ...

$$\sum_{n=1}^{\infty} \frac{1}{n^2 + n}$$

4) Use the comparison test to determine whether the series ...

$$\sum_{n=1}^{\infty} \frac{n+2}{n^2-1}$$

is convergent or divergent.

SUse the limit comparison test to determine whether the series ...

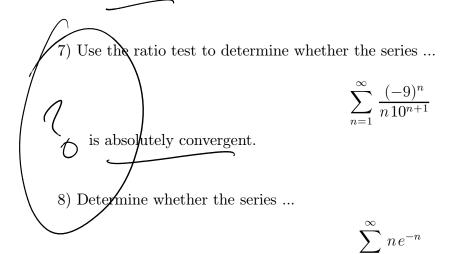
$$\sum_{n=1}^{\infty} \frac{n^2 + n}{\sqrt{1 + n^7}}$$

is convergent or divergent.

 $\begin{pmatrix} 6 \end{pmatrix}$  Use the alternating series test to determine whether the alternating series ...

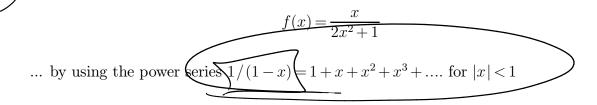
$$\sum_{n=1}^{\infty} \frac{(-9)^n}{n9^{n+1}}$$

is convergent or divergent.



is absolutely convergent, conditionally convergent, or divergent

9) Find a power series representation with interval of convergence for the function ...



N) Find a power series representation with interval of convergence for the function ...  $f(x) = \frac{x}{(4+x^2)^2}$ 

/11) Find the Maclaurin series for  $f(x) = \sin(x)$  and find it's radius of convergence.