MATH 231 TEST I SHOW ALL WORK; BE NEAT
USE ONE SIDE OF EACH PAGE ONLY

1. If $A = \begin{bmatrix} 5 & 6 \\ 7 & 8 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 9 \\ 3 & 4 \end{bmatrix}$ find $A - 2B$.

?

2. Find $\begin{bmatrix} 1 & 0 \\ 0 & 1 \\ 2 & -1 \\ 3 & 3 \end{bmatrix} \begin{bmatrix} 7 & -2 & 3 \\ 6 & -1 & 1 \end{bmatrix}$

3. Solve using cramers rule: $x + y = 10$
$2x - 3y = 5$

4. Find the equilibrium pt.
Supply: $p = q + 1$
Demand: $2p + q = 8$

5. $\det \begin{bmatrix} 0 & 10 & 0 & 38 \\ 3 & -4 & 0 & 50 \\ 7 & 14 & 1 & 5 \\ 0 & \frac{1}{2} & 0 & 2 \end{bmatrix} = ?$

6. Solve $AX = B$ given

$A^{-1} = \begin{bmatrix} 1 & 0 & 3 \\ 1 & -1 & 2 \\ 1 & 0 & 1 \end{bmatrix}$ for $B = \begin{bmatrix} 3 \\ 4 \\ 5 \end{bmatrix}$

and for $B = \begin{bmatrix} 1 \\ -1 \\ 1 \end{bmatrix}$

7. For $A = \begin{bmatrix} 1 & 1 & 0 \\ 1 & -1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

Find A^{-1}.

8. Solve: $x + y + z = 6$
$x - y + 2z = 5$
$2x \quad + z = 5$

9. Find

A) $\det \begin{bmatrix} 17 & 4 \\ -1 & 2 \end{bmatrix}$

B.) $\det \begin{bmatrix} 1 & -7 & 4 & 7 \\ 0 & 2 & 19 & 8 \\ 0 & 0 & 3 & 9 \\ 0 & 0 & 0 & 4 \end{bmatrix}$

C.) $\det \begin{bmatrix} -5 & 7 & 8 & 25 \\ -5 & 7 & 8 & 25 \\ 1 & 0 & 3 & 4 \\ 15 & 10 & 20 & 30 \end{bmatrix}$

10. A factory makes regular, deluxe and super-deluxe tricycles. A regular tricycle uses 1 gismo, 1 ox and 3 tags. A deluxe tricycles uses 2 tags, 1 ox and 3 gismo's. A super-deluxe uses no ox's, 2 gismo's and 5 tags. The factory has 26 tags 10 ox's and 18 gismo's. How many tricycles of each type must be made to use up the stock of gismo's, ox's and tags?

MATH 231 TEST II BE NEAT, SHOW ALL WORK
USE ONE SIDE OF EACH PAGE ONLY

1. $\lim_{x \to 3} (x^3+3x^2-27) = ?$

2. Find y' if $y = 5x^{100} + \frac{x^{17}}{17} + \pi - x^{-1} + x^{4/7}$.

3. Find dy/dx if $y = (x^2+1)^4(x^2-1)^4$.

4. Find $f'(t)$ if $f(t) = \frac{t^2 - t^{-2}}{1+5t^3}$.

5. Find dz/du if $z = \sqrt{u}\,(\sqrt{u} + \frac{1}{2})^{3/2}$.

X 6. Find the equation of the tangent line to $y=f(x)$ at $x=3$ for $f(x) = (x^2+1)^{-1}$.

1

7. $\lim_{x \to -2} \frac{x^3-x^2-2x+8}{x+2} = ?$

8. Find $\frac{dy}{dx}$ if $y = (u^{100}+u^2)^{200}$ and $u = x^2+x+x^{-1}+x^{-2}$

9. $\lim_{h \to 0} \frac{\sqrt{x+h} - \sqrt{x}}{h} = ?$

10. Where is $f(x) = \begin{cases} x^2 & x \le 2 \\ 8-3x & 2 < x \end{cases}$ continuous?

Why?

MATH 231 TEST III SHOW <u>ALL</u> WORK; BE <u>NEAT</u>
USE <u>ONE</u> SIDE OF EACH PAGE <u>ONLY</u>

IN 1–4 find y' if

1. $y = x^2e^x + e$ 2. $y = e^{-x^2/\pi} + x^2$

3. $y = (\ln x)^2 + \ln x^2$ 4. $y = \ln\left[\frac{x^2}{1+x^2}\right] + 7$

In 5 & 6 solve for x

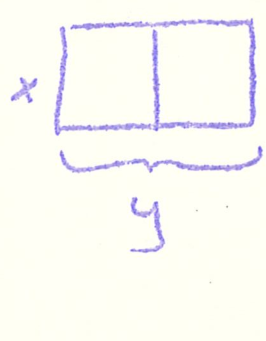
1 5. $\log 2 + \log x = \log(x+1)$ 6. $\log_2 \frac{1}{\sqrt[3]{16}} = x$

7. If the cost function is $Q(x) = 2x^2 + 1$, find the value of x that minimize the average cost $q(x)$.

8. If $R(x) = 48x + 2x^2 - \frac{4}{3}x^3$ is the total revenue what value of x maximizes $R(x)$

9. For $f(x) = x^3 - 3x^2 + 7$ find all relative min's and max's and points of inflection (show <u>all</u> work.)

10. A rectangular field, to contain 2400 square yards of area, is to be fenced off and divided into two equal parts by another fence parallel to one side of the rectangle (see figure) Find the dimensions that will minimize the amount of fencing.



MATH 231 TEST IV SHOW ALL WORK; BE NEAT
USE ONE SIDE OF EACH PAGE ONLY

In 1 & 2 find the differentials

1. $y = e^{x^2} + \ln x$ 2. $w = (u^3+1)^{100}$

3. $\int 4 + 2x^2 - x^{-3} + x^{\frac{1}{2}}\, dx = ?$

4. $\int (2x+1)^4 + e^x\, dx = ?$

In 5 & 6 use differentials to approximate, show all work

5. $\sqrt{.98}$ 6. $(10.1)^6$

7. Solve $\frac{dy}{dx} = \frac{4}{(2x+7)^2}$

8. $\int x\,(x^2+1)^{100}\, dx = ?$

9. $\int \frac{x\,dx}{(4x^2+7)^2} = ?$

10. Solve for y as a function of x given $\frac{dy}{dx} = y$ and $y=1$ when $x=0$.