Unity University

College Of Distance Education

Department Of Common Course

Work Sheet For Maths For Social Science

Name_____

Id. No_____

Department _____

Center _____

Year _____Semester _____

This is a test paper you are expected to do on your own. It carries 25 points. The test paper should be completed and mailed to the School of Distance and Continuing Education for evaluation. Do not try to complete the worksheet until you have covered all the lessons and exercises in the course material.

Any questions in the course that you have not been able to understand should be stated on a separate sheet of paper and attached to this worksheet. Your tutor will clarify them for you.

After completing this test paper, be certain to write your Name, Id.No and Address on the first page. Only your Name and Id.No on the other pages.

Part I: Write "True" if the statement is correct and "False" if it is Incorrect. Use the spaces provided to give your answers (6 points).

1. If the truth values of $p, q \wedge r$ are T, T and F, respectively, then the truth value of $(p \wedge q) \Longleftrightarrow r$ is F.
2. For two sets $A \wedge B, (A \cup B) = A \cap B$.
3. The Transitive property on N states that: For any two natural numbers *a* and *b*, either $a > b \vee a = b \vee b > a$.
4. For any real number $x > 0$, $\log_3 x > \log_2 x$.
5. If a function is differentiable, then it is continuous.
6. If $\lim_{x \to a} f(x) = 0$ *and* $\lim_{x \to a} g(x) = 0$, *then* $\lim_{x \to a} \left(\frac{f(x)}{g(x)} \right)$ doesn't exist.

Part II: <u>Short Answer Questions</u> (4 points)

Write the most simplified answer in the space provided.

1. Let p and q are statements stand for :

   P: x is number and q: x is prime number, then the truth value of $(\exists x)(p(x) \Rightarrow q(x))$ is_____.

2. If $\begin{pmatrix} 3 & -2 & a \\ 4 & -1 & 2 \end{pmatrix} \begin{pmatrix} -1 & 3 \\ 2 & b \\ 3 & -2 \end{pmatrix} = \begin{pmatrix} 5 & -11 \\ 0 & 2 \end{pmatrix}$, then the values of $a =$____ *and* $b =$____ .
3. Differentiate the following:

   a) $\frac{d}{dx}\left[x^2 + 3xe^{2x}\right] =$_____

   b) $g(x) = 2x^3 + 4x^2 - 7$, *then* $g'''(x) =$_____.

Part III: Circle round only the letter of the correct answer from the given alternatives (9 pts.).

1. Which of the following statements is true?

   A. The inverse of $R=\{(x,y): x+2y=9\}$ is $R^{-1}=\{(y,x): y+2x=9\}$.

   B. The function $f(x)=3^{-x}$ is increasing.

   C. If $f(x)=\frac{1}{x}$, then $(f^{-1}\circ f)(x)=x$.

   D. The domain of the function $f(x)=\frac{x+1}{x^3+x^2}$ is $\Re\{-1,0¿¿$.

2. Let $a\in\Re$. Which of the following statements is **not** true about the function $f(x)=\log_a x$ for $a>0$ and $a\neq 1$?

   A. Its domain is the set of positive real numbers

   B. Its range is the set of real numbers.

   C. Its graph exhibits logarithmic growth if $0<a<1$.

   D. The line $l:\ x=0$ is a vertical asymptote.

3. Which of the following is true?

   A. $\left(2^{\frac{1}{2}}-2^{-\frac{1}{2}}\right)^2=\frac{1}{\sqrt{2}}$

   B. $2^{\frac{1}{2}}2^{\frac{1}{2}} > 2^{\frac{1}{2}}+2^{\frac{1}{2}}$

   C. $\frac{2^{-2}-\left(\frac{1}{2}\right)^{-1}}{2^{-2}}=7$

   D. $3^{\frac{1}{2}}3^{\frac{1}{2}}3^{\frac{1}{2}}=3^{\frac{1}{2}}+3^{\frac{1}{2}}+3^{\frac{1}{2}}$

   E. None of the above

4. If $f(x) = x^3+ 3x^2 + 4x + 5$ and $g(x) = 5$, then $g(f(x))$ =_____

   A) $(5x^2+15x + 25$ C) 5

   B) $5x^3+15x^2+ 20x + 25$ 5 D) 225 E) 1125

5. Let $A=\begin{pmatrix}2 & 2\\ -1 & 1\end{pmatrix}$, then which of the following is not true?

A. $|A|=4$

B. A has inverse

C. A is skew symmetric matrix

D. $A^{-1}=\begin{pmatrix}1/4 & -1/2\\ 1/4 & 1/2\end{pmatrix}$

6. The converse of the proposition "If it is cold, then I will not go walking" is:

A. If it is not cold, then I will go walking.

B. If it is not cold, then I will not go walking.

C. If I did not go walking, then it is cold.

D. If I go walking, then it is not cold.

7. Let $U=\{x\in Z \,/\, -2\le x\le 6\}$, $A=\{x\in U/x=2n \text{ and } n \text{ is integer}\}$ and $B=\{x\in U/\ x=3n \text{ and } n \text{ is integer}\}$, Which of the following is true?

A. $A=\{-2,2,4,6\}$

B. $B=\{0,1,3,6\}$

C. $A\setminus B=\{-2,2,4\}$

D. $A=\{1,3,5\}$

8. $\lim_{x\to 0}\frac{\sin x}{x^3+3x}=$_____

A. 1 B. $\frac{1}{4}$ C. 3 D. ∞ E. $\frac{1}{3}$

9. Let $y=\sqrt{3-2x}$, then $\frac{dy}{dx}=$_____

A. $\frac{1}{2\sqrt{3-2x}}$ B. $-\frac{1}{\sqrt{3-2x}}$

C. $-\frac{(3-2x)^{3/2}}{3}$ D. $-\frac{1}{3-2x}$ E. $\frac{2}{3}(3-2x)^{3/2}$.

Part IV: <u>Workout Questions</u> (6 pts.)

Solve each of the following problems by showing all the necessary steps.

1) Determine the validity of the argument $p \Longrightarrow (q \vee r), \neg r, p \vdash q$ **using truth table**.

2) Find the first derivative of the following

$a.\quad f(x) = \ln(\sin x)$ **(2pts)**

$b.\quad f(x) = 3^{x^2}$ **(2pts)**

Answer sheet

	T/False		M/CHOICE
1	_____	1	_____
2	_____	2	_____
3	_____	3	_____
4	_____	4	_____
5	_____	5	_____
6	_____	6	_____
		7	_____
		8	_____
		9	_____

Short Answer

_____

1 __

a=_____

2 __

b=_____

__

a=_____

3 __