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a) $f(x)=1+\cos x$ d) $f(x)=\sin(x+\frac{\pi}{2})$ f) $f(x)=\tan 2x$

11. Find the inverse of matrix $A=\begin{pmatrix}3 & 2 & -1\\ 1 & -1 & 0\\ 2 & 0 & 1\end{pmatrix}$

12. Find the Eigen value and Eigen vectors of the matrix $A=\begin{pmatrix}2 & 1 & -1\\ 3 & 2 & -3\\ 3 & 1 & -2\end{pmatrix}$

13. Solve the following SLE by using Cramer's rule

a. $3x_1+2x_2+4x_3=1$
$2x_1-2x_2+x_3=0$
$x_1+2x_2+3x_3=1$

b. $x_1+x_2+x_3=9$
$2x_1+4x_2+-3x_3=1$
$3x_1+6x_2-5x_3=0$

Note: Form a group of 5 students in your section and do all the problems. Then submit it on or before the class end.



WOLAITA SODO UNIVERSITY
COLLEGE OF NATURAL AND COMPUTATIONAL SCIENCE
DEPARTMENT OF MATHEMATICS
July, 2022.

Mathematics for Social Sciences (Math 1011)
Group Assignment (30%)

1. Let R be a relation on the set $A=\{1,2,3,4,5,6,7\}$ defined by $R=\{(a,b):4 \text{ divides } a-b\}$.
   i) List the elements of R
   ii) Find $Dom(R)$ & $Range(R)$
   iii) Find the elements of R^{-1}
   iv) Find $Dom(R^{-1})$ & $Range(R^{-1})$
2. Find the domain and range of the following functions.
   a) $f(x)=1+8x-2x^2$
   b) $f(x)=\dfrac{1}{x^2-5x+6}$
   c) $f(x)=\sqrt{x^2-6x+8}$
3. Given $f(x)=\begin{cases}3x-5, & x<1\\ x^2-1, & x\geq 1\end{cases}$.
   Find a) $f(-3)$ b) $f(1)$ c) $f(6)$
4. If $f(x)=x^3+2$ and $g(x)=\dfrac{2}{x-1}$, find a formula for each of the following and state its domain.
   a) $(f+g)(x)$
   b) $(f\circ g)(x)$
   c) $\left(\dfrac{g}{f}\right)(x)$
5. Let $f(x)=5x-3$. Find $g(x)$ so that $(f\circ g)(x)=2x+7$.
6. If f is a real function defined by $f(x)=\dfrac{x-1}{x+1}$. Show that $f(2x)=\dfrac{3f(x)+1}{f(x)+3}$.
7. Solve the given exponential equation.
   a) $2^{x-1}=8$ b) $3^{2x}=243$
8. Let $f(x)=2^x$. Show that $f(x+3)=8f(x)$.
9. Sketch the graph of the given function and identify the domain, range, intercepts and asymptotes.
   a) $f(x)=\log_2(x-3)$ b) $f(x)=-3+\log_2 x$
10. Sketch the graph of