DTL Assignment

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Q.1) Use Cramer's rule to solve:
$x + 2z = 6, -x + 4y + 6z = 30, -x - 2y + 3z = 8.$ [3]

Q.2) Prove that the line $2x - 3y = 9$ touches the conics $y^2 = -8x$. Also the point of contact. [1]

Q.3)Determine whether the following are linear transformations or not?
(a)$T : P-> P, T(p(x)) = p(x+1)$ [3]
(b)$T : P-> P, T(a + bx + cx2) = (a+1) + (b+1)x + (c+1)x^2.$ [3]

Q.4) If x^2 and 1 are solutions of $yy'' - xy' = 0$ then so is any linear combination of these. State true or false and justify. [2]

Q.5) If a matrix A= $\begin{bmatrix} 0 & a & -3 \\ 2 & 0 & -1 \\ b & 1 & 0 \end{bmatrix}$
is a skew-symmetric, find the values of 'a' and 'b'.

Q.6) True or false with Justification.
(a) If A and B are symmetric then AB is symmetric.
(a) If A and B are invertible then AB is invertible. [3]

Q.7) S is the set of all skew symmetric matrices of order 3. Is S a subspace of M (R). [3]

Q.8) Using Elementery row transformations, find the inverse of following matrix:
A= $\begin{bmatrix} 1 & 1 & 3 \\ 1 & 3 & -3 \\ -2 & -4 & -4 \end{bmatrix}$ [3]

Q.9) Find a linear ordinary differential equation for which the function $e^{-x}\cos 2x$ and $e^{-x}\sin 2x$ are linearly independent solutions. [3]

Q.10) Define solenoidal vector and irrotational vector. [2]