

MATHEMATICS 1 - MAKEUP 1.1

NAME:	
DATE:	TEACHER:

Total credit:

Give reasons for all the answers !

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1. Find the domain of the function $f(x) = \ln \frac{2-x}{1+x^2}$. **Eval:**
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2. Differentiate the function $f(x) = (5 + x^2) \sin 5x$. **Eval:**
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3. Given function $f(x) = 2x^2 - 5x - 3$ and point $A = [2, -5]$. Is the straight line $x + 3y + 13 = 0$ tangent line or normal line or nothing to f at the point A ? **Eval:**
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4. The function $f(x) = \frac{2-\ln x}{x}$ assumes at $x = e$ a local extreme. Yes or not? **Eval:**
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5. Decide, if the set of vectors $\vec{u} = (3, -1, 2, 1)$, $\vec{v} = (0, 0, 0, 2)$, $\vec{w} = (6, -2, 4, 2)$ is linearly dependent or independent. **Eval:**
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6. Find the rank of the matrix
- $$A = \begin{pmatrix} 3 & 2 & 1 \\ 0 & 0 & 2 \\ 0 & 0 & 7 \end{pmatrix}.$$
- Eval:**
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7. For $x \in \mathbb{R}$ solve the equation
- $$\begin{vmatrix} 4-x & 2 \\ 3 & 4-x \end{vmatrix} = -6.$$
- Eval:**
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8. Solve the system of linear equations in dependence on $\alpha \in \mathbb{R}$, for which the augmented matrix is as follows
- $$\left(\begin{array}{cc|c} 0 & 1 & \alpha \\ 1 & 1 & 2 \end{array} \right)$$
- Eval:**
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9. Write the general equation of the line p which passes through the point $A = [5, -7]$ and has the normal vector $\mathbf{n} = (1, -1)$. **Eval:**
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10. Find the intersection of the line $p : x = 1 + 3t, y = 2t, z = 3$ and the plane $\rho : 2x - y - 3z - 1 = 0$. **Eval:**
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