MATH 54 - HINTS TO HOMEWORK 3

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Here are a couple of hints to Homework 3! Enjoy :)

SECTION 3.1: INTRODUCTION TO DETERMINANTS

3.1.9, 3.1.13. Always try to look for a row/column full of zeros! May Bomberman be with you :)

3.1.19, 3.1.20. What you're asked to do is: compute the determinants of the first matrix and of the second matrix and compare them. Also, explain how to obtain the second matrix from the first using a row-operation!

3.1.37. No, $det(5A) = 5^2 det(A) = 25 det(A)$

3.1.40.

(a) F (it's the same, not the negative)
(b) F (product, not sum)

SECTION 3.2: PROPERTIES OF DETERMINANTS

3.2.1. Interchanging 2 rows results in a $-$ sign in the determinant!

3.2.5, 3.2.7. Just row-reduce the matrices until the determinant of the reduced matrix is easier to find!

3.2.21, 2.3.21. A matrix A is invertible if and only if $det(A) \neq 0$.

3.2.27.

(a) **T?** I think the book uses the term 'row-replacement' to mean: " add k times a row to another row".
(b) **F** (not true for *any* echelon form, what about the reduced row-echelon form?)
(c) **T** (A is not invertible)
(d) **F**

3.2.28.

(a) **T** (basically because $(-1)(-1) = 1$)
(b) **F**
(c) **F** (just means the columns are linearly dependent)
(d) **F** ($det(A^T) = det(A)$)

3.2.31, 3.2.33, 3.2.34, 3.2.35, 3.2.36. All you need to use is the fact that $det(AB) = det(A)det(B)$.

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3.2.39. Use the facts that $det(AB) = det(A)det(B)$, $det(kA) = k^3 det(A)$, $det(A^T) = det(A)$, $det(A^{-1}) = \frac{1}{det(A)}$ and $det(A^k) = det(A)^k$.

SECTION 3.3: CRAMER'S RULE, VOLUME, AND LINEAR TRANSFORMATIONS

For all those problems, all you need to do is imitate the techniques presented in the book! This section will not be on the exam!

3.3.19. $\begin{vmatrix} 5 & 6 \\ 2 & 4 \end{vmatrix}$