Some properties of the determinant

- If E is an elementary matrix then $det(EA) = det(E)det(A)$.
- (Theorem 2.3.3) A is invertible iff $det(A) \neq 0$.
- (Theorem 2.3.4) $det(AB) = det(A)det(B)$.
- (Theorem 2.3.5) If A is invertible then $det(A^{-1}) = \dfrac{1}{det(A)}$.

The adjoint

Definition

Suppose that A is a square matrix then the matrix of cofactors of A is

$$\begin{pmatrix} C_{11} & C_{12} & \dots & C_{1n} \\ C_{21} & C_{22} & \dots & C_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ C_{n1} & C_{n2} & \dots & C_{nn} \end{pmatrix}$$

Its transpose is called the adjoint of A and written $adj(A)$.

Theorem (2.3.6)

If A is invertible then

$$A^{-1} = \frac{1}{det(A)} adj(A)$$

Cramer's rule

Theorem (2.3.7)

Suppose A is invertible. Then the solution to $Ax = b$ is

$$x_1 = \frac{det(A_1)}{det(A)}, x_2 = \frac{det(A_2)}{det(A)}, \ldots, x_n = \frac{det(A_n)}{det(A)}$$

where A_j is the matrix obtained by replacing the j^{th} column of A by b.

The test

- The first test is scheduled for Oct. 10 at 10:30 am (that is class time). The test will be 50 minutes.
- If your surname is in the range A - O, you write the test in T28/001; if your surname is in the range P - Z you write in T29/101.
- The test will be multiple choice; bring an HB pencil. McMaster approved Casio fx-991MS or MSplus calculators are allowed but no other aids.
- Please bring your ID card with you to the test.
- The test will cover sections 1.1 - 1.8 and 2.1 - 2.3.
- I will post supplementary questions and a practice test.
- Matt Luther will run a review session on Thursday, Oct. 9 from 5:30 - 7:30 in HH 302. Come prepared with questions and/or send him questions ahead of time.
- There will be no Friday morning tutorial on Oct. 10.