

Answer key for MATH 1300, April 2007 final exam

1. a) $\begin{bmatrix} 1 & 2 & 0 & 1 & 0 & 2 \\ 0 & 0 & 1 & -1 & 0 & 4 \\ 0 & 0 & 0 & 0 & 1 & 1 \end{bmatrix}$, b) $x_1=2-2s-t$, $x_2=s$, $x_3=4+t$, $x_4=t$, $x_5=1$.
2. -2
3. a) $-1/3$ b) -27 .
4. a) $\frac{\sqrt{3}}{2}$ b) 42 .
5. a) $x=1-2t$, $y=2t$, $z=1$, b) dot product of $(2, 2, -7)$ and $(-2, 2, 0)$ is 0 , c) $\frac{9}{\sqrt{57}}$.
6. a) $\frac{-10}{3}$ b) all k not equal to $3/2$ c) none.
7. Not in the span.
8. a) no b) yes c) yes.
9. b) $A^{-1} = A + I$.
10. a) 6 b) 2 c) $2, 4$.
11. a) $\{(1, -2, 3, 0, 2, 0), (0, 0, 0, 1, -1, 0), (0, 0, 0, 0, 0, 1)\}$, dimension is 3 .
b) $\{(2, 1, 0, 0, 0, 0), (-3, 0, 1, 0, 0, 0), (-2, 0, 0, 1, 1, 0)\}$, dimension is 3 .
c) $\{(1, -3, 2, 5), (0, 1, 0, -1), (0, 0, 0, 1)\}$, dimension is 3 .