Facit:

Tentamen 20.5.08:

1. 20
2. Projektionen av a på $\begin{pmatrix}0\\1\\1\end{pmatrix}$
   ——— " ——— på $\frac{3}{2}(1\ 0\ 1)^T$
   vinkeln $\varphi = \frac{\pi}{3} = 60°$.
3. $q_1 = \frac{1}{\sqrt{2}}\begin{pmatrix}1\\1\\0\end{pmatrix}$, $q_2 = \frac{1}{\sqrt{3}}\begin{pmatrix}1\\-1\\1\end{pmatrix}$, $q_3 = \frac{1}{\sqrt{6}}\begin{pmatrix}-1\\1\\2\end{pmatrix}$.
4. $Q = \begin{pmatrix}-1/\sqrt{2} & 2/3 & 1/3\sqrt{2}\\ 0 & -1/3 & 4/3\sqrt{2}\\ 1/\sqrt{2} & 2/3 & 1/3\sqrt{2}\end{pmatrix}$, $D = \begin{pmatrix}0 & & \\ & 9 & \\ & & 18\end{pmatrix}$

Tentamen 22.5.07:

1. $t \in \{-2, -19/6\}$
2. $P = \frac{1}{14}\begin{pmatrix}10 & 6 & -2\\ 6 & 5 & 3\\ -2 & 3 & 13\end{pmatrix}$, $S = \frac{1}{7}\begin{pmatrix}3 & 6 & -2\\ 6 & -2 & 3\\ -2 & 3 & 6\end{pmatrix}$
3. $x = \frac{1}{3}\begin{pmatrix}6\\1\\0\end{pmatrix} + \frac{5}{2}\begin{pmatrix}-3\\1\\2\end{pmatrix}$, $P = Ax = \frac{1}{3}\begin{pmatrix}7\\5\\2\end{pmatrix}$.
4. $Q = \begin{pmatrix}1/\sqrt{2} & 0 & 1/2 & -1/2\\ 0 & -1/\sqrt{2} & 1/2 & 1/2\\ 1/\sqrt{2} & 0 & -1/2 & 1/2\\ 0 & 1/\sqrt{2} & 1/2 & 1/2\end{pmatrix}$, $D = \begin{pmatrix}4 & & & \\ & 4 & & \\ & & 2 & \\ & & & -2\end{pmatrix}$

Tentamen 23.5.06:

1. -2
2. $P = \frac{1}{6}\begin{pmatrix}2 & -2 & 2\\ -2 & 5 & 1\\ 2 & 1 & 5\end{pmatrix}$, $Pb = \frac{1}{6}\begin{pmatrix}8\\-11\\5\end{pmatrix}$.
3. $q_1 = \frac{1}{\sqrt{2}}\begin{pmatrix}0\\1\\-1\end{pmatrix}$, $q_2 = \frac{1}{\sqrt{3}}\begin{pmatrix}1\\1\\1\end{pmatrix}$, $q_3 = \frac{1}{\sqrt{6}}\begin{pmatrix}-2\\1\\1\end{pmatrix}$
5. $Q = \frac{1}{\sqrt{2}}\begin{pmatrix}1 & 0 & 0 & -1\\ 0 & 1 & -1 & 0\\ 1 & 0 & 0 & 1\\ 0 & 1 & 1 & 0\end{pmatrix}$, $D = \begin{pmatrix}1 & & & \\ & -1 & & \\ & & 3 & \\ & & & -3\end{pmatrix}$

Tentamen 26.2.04:

1. -20
2. $Sy = \frac{1}{2}\begin{pmatrix}y_1 - y_2 - y_3 - y_4\\ -y_1 + y_2 - y_3 - y_4\\ -y_1 - y_2 + y_3 - y_4\\ -y_1 - y_2 - y_3 + y_4\end{pmatrix}$
3. $x = \begin{pmatrix}2\\5\\-11\end{pmatrix}$
4. $A^n = Q D^n Q^T = \frac{1}{3}\begin{pmatrix}-\sqrt{2} & 1\\ 1 & \sqrt{2}\end{pmatrix}\begin{pmatrix}0 & \\ & 3^n\end{pmatrix}\begin{pmatrix}-\sqrt{2} & 1\\ 1 & \sqrt{2}\end{pmatrix} = \ldots = 3^{n-1}\cdot A$.

Tentamen 26.2.03:

1. 32
2. $P = \frac{1}{10}\begin{pmatrix}6 & 2 & -2 & 4\\ 2 & 9 & 1 & -2\\ -2 & 1 & 9 & 2\\ 4 & -2 & 2 & 6\end{pmatrix}$, $S = \frac{1}{5}\begin{pmatrix}1 & 2 & -2 & 4\\ 2 & 4 & 1 & -2\\ -2 & 1 & 4 & 2\\ 4 & -2 & 2 & 1\end{pmatrix}$
3. $x = \frac{2}{35}\begin{pmatrix}-33\\23\end{pmatrix}$
5. $A^n = B D^n B^{-1} = \frac{1}{4}\begin{pmatrix}1 & -1\\ 1 & 3\end{pmatrix}\begin{pmatrix}1 & 0\\ 0 & (3/5)^n\end{pmatrix}\begin{pmatrix}3 & 1\\ -1 & 1\end{pmatrix}$
   $= \frac{1}{4}\begin{pmatrix}3 + (\frac{3}{5})^n & 1 - (\frac{3}{5})^n\\ 3 - (\frac{3}{5})^n & 1 + 3\cdot(\frac{3}{5})^n\end{pmatrix}$.

   $\longrightarrow \frac{1}{4}\begin{pmatrix}3 & 1\\ 3 & 1\end{pmatrix}$, då $n \to +\infty$.