

## Exam 2 answers

1.  $y(t) = \frac{9}{8}e^t + \frac{1}{24}e^{-3t} - \frac{1}{6}\cos 3t - \frac{1}{3}\sin 3t$

2. The period is  $T = \frac{2\pi}{\sqrt{3}}$  and the amplitude is  $A = \sqrt{\frac{19}{3}}$

3.  $\det A = 6$  which implies that the null space of  $A$  contains only the zero vector;  $Ax = [7 \ 8 \ 0]^T$

4.  $F(s) = \frac{1}{s} + \frac{e^{-s}-1}{s^2}$

5.  $f(t) = \frac{1}{2} + \frac{1}{2}e^{2t} - e^{-2t} + 2\delta(t)$

6.  $y(t) = \frac{2}{3}\sin 3t + \frac{1}{3}(1 - \cos 3(t - 2))H(t - 2)$