# 15.37

lördag 24 december 2022 14:05

a) $r^2 - 3r + 2 = 0 \quad r = 3/2 \pm \sqrt{\frac{9}{4} - \frac{8}{4}} \quad r_1 = 2 \quad r_2 = 1$

Sv: $y = C_1 e^{2x} + C_2 e^{x}$

b) $r^2 - 4r + 4 = 0 \quad r = 2 \pm \sqrt{4 - 4} \quad r_1 = r_2 = 2$

Sv: $y = (C_1 x + C_2) e^{2x}$

g) $r^2 + 6r + 9 = 0 \quad r = -3 \pm \sqrt{9 - 9} \quad r_1 = r_2 = -3$

Sv: $y = (C_1 x + C_2) e^{-3x}$

c) $r^2 - 6r + 10 = 0 \quad r = 3 \pm \sqrt{9 - 10} = 3 \pm \sqrt{-1} = 3 \pm i$

Sv: $y = e^3 (A \cos x + B \sin x)$

d) $r^2 - r - 2 = 0 \quad r = 1/2 \pm \sqrt{1/4 + 8/4} = 1/2 \pm 3/2 \quad r_1 = 2 \quad r_2 = -1$

Sv: $y = C_1 e^{2x} + C_2 e^{-x}$

e) $r^2 - 10r + 61 = 0 \quad r = 5 \pm \sqrt{25 - 61} = 5 \pm 6i$

Sv: $y = e^5 (A \cos 6x + B \sin 6x)$

f) $r^2 - 2r + 5 = 0 \quad r = 1 \pm \sqrt{1 - 5} = 1 \pm 2i$

Sv: $y = e^x (A \cos 2x + B \sin 2x)$