

Midterm exam fys3110 Autumn 2018

candidate: 15201

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1 Problem 1

Operators A and B defined ito. HO oscillator ops a_x and a_y

$$A = \frac{1}{\sqrt{2}}(a_x + a_y) \quad B = \frac{1}{\sqrt{2}}(a_x - a_y)$$

a_x, a_y satisfies

$$[a_x, a_x^\dagger] = [a_y, a_y^\dagger] = 1 \quad [a_x, a_y] = [a_x, a_y^\dagger] = 0$$

1.1 calc commutators $[A, A^\dagger] \quad [B, B^\dagger] \quad [A, B] \quad [A, B^\dagger]$