



## Kreyszig (9th. edition) section 2.1

4,10,12,14,20

## Kreyszig (9th edition) section 2.2

2,6,9,18,20

**Exam problems** ([www.math.ntnu.no/emner/TMA4110/2010h/eksoppg/xoppg.pdf](http://www.math.ntnu.no/emner/TMA4110/2010h/eksoppg/xoppg.pdf))

**A-2** a) Find all complex numbers  $z$  satisfying

$$z^3 = -1 + i,$$

and graph them in the complex plane.

b) Let  $w$  be the solution from **a)** in the second quadrant. Find a positive integer  $n$  such that  $w^n$  is real.

## Multiple-choice questions

**1** Which of these alternatives is the polar form  $r(\cos \theta + i \sin \theta) = re^{i\theta}$  of

$$z = \frac{1 + \sqrt{3} + i(\sqrt{3} - 1)}{-1 + i}?$$

**A:**  $\sqrt{2}e^{i(4\pi/3)}$

**B:**  $2e^{i(4\pi/3)}$

**C:**  $2e^{i(\pi/3)}$

**D:**  $\sqrt{2}e^{i(\pi/3)}$

**2** Suppose that  $y = xe^x$  is a solution of the differential equation

$$y'' - 2y' + ay = 0?$$

What is the value of the parameter  $a$ ?

**A:**  $a = -1$

**B:**  $a = 1$

**C:**  $a = \sqrt{2}$

**D:**  $a = 2$