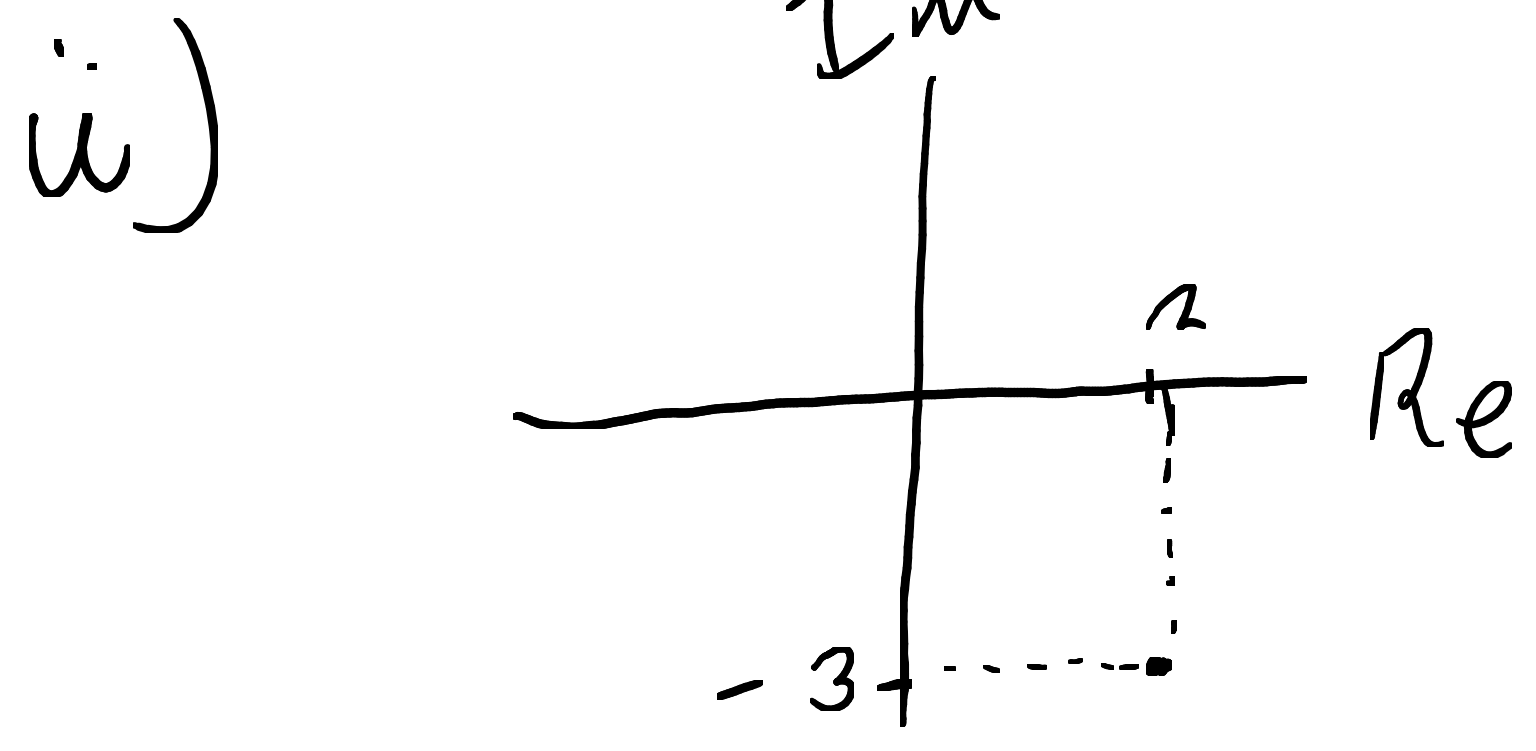
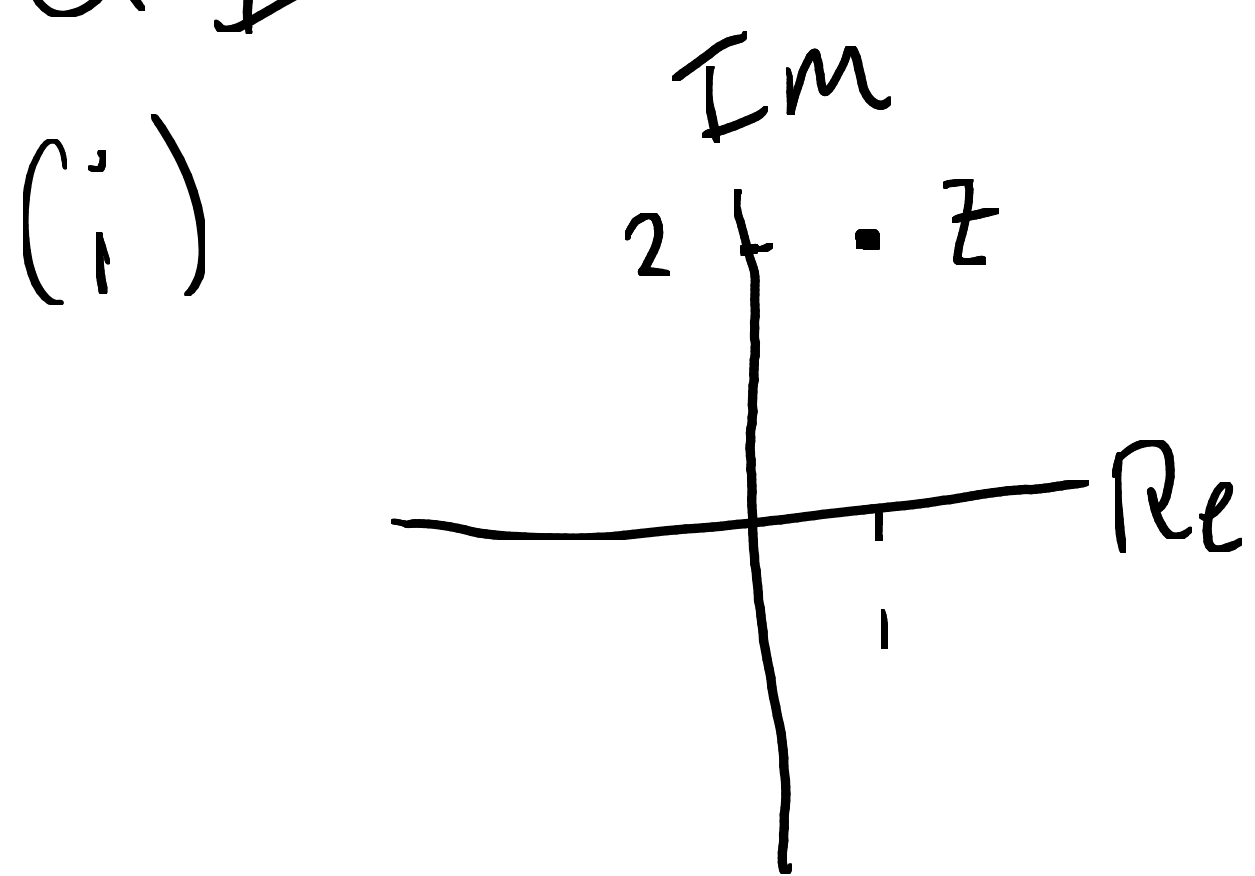
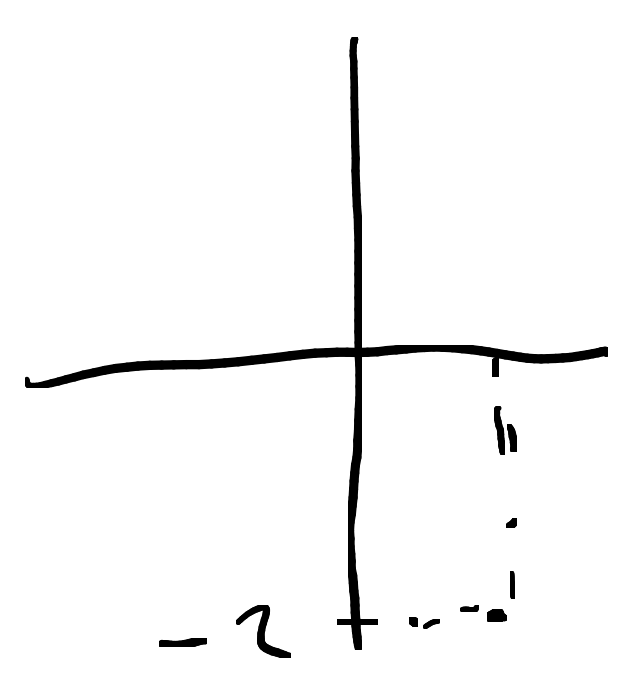


Coupled ODEs Sheet A

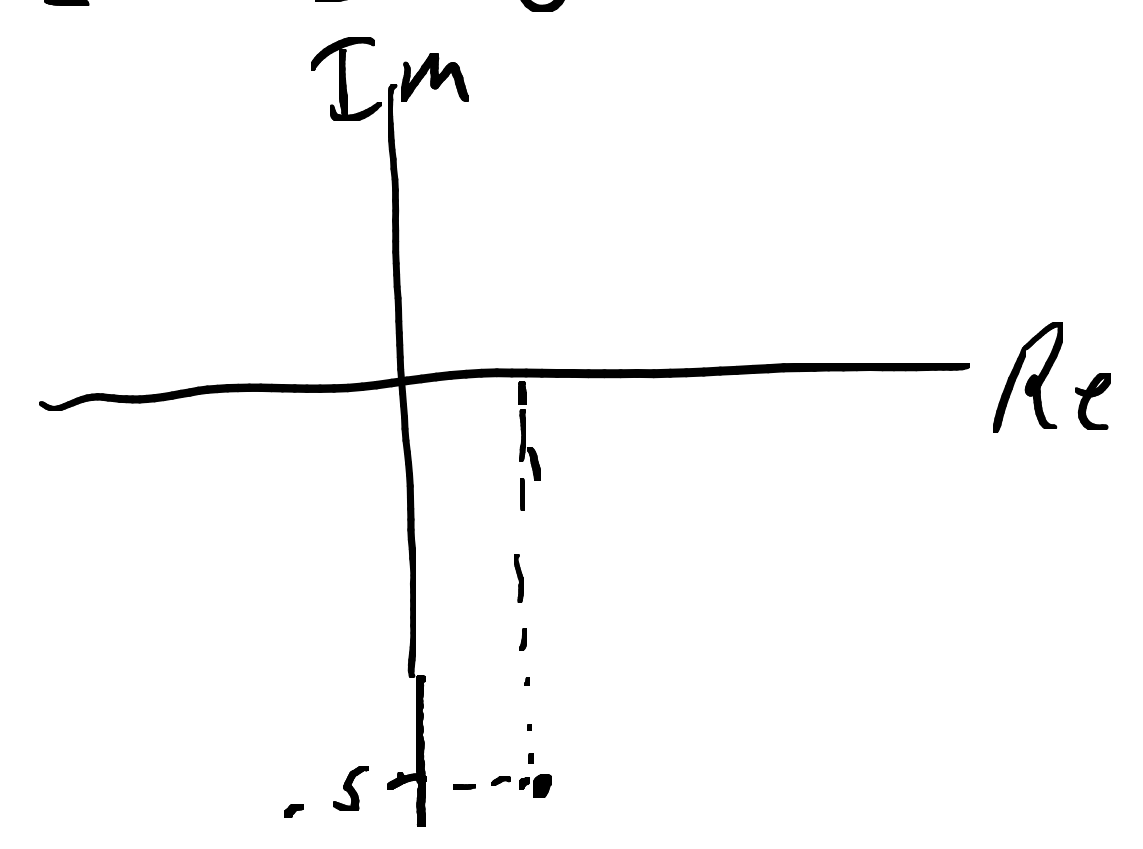
Q1.1 $z = 1 + 2i$ $w = 2 - 3i$



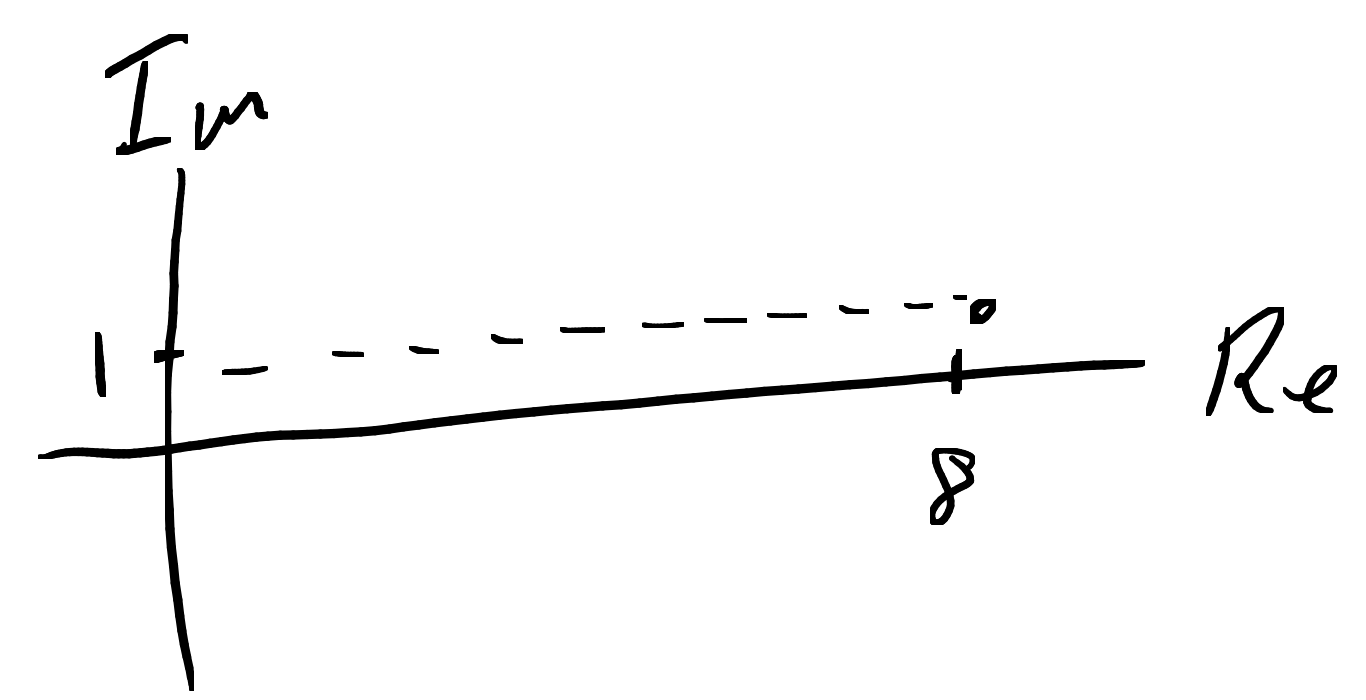
(iii) $\bar{z} = 1 - 2i$



(iv) $w - z = 1 - 5i$

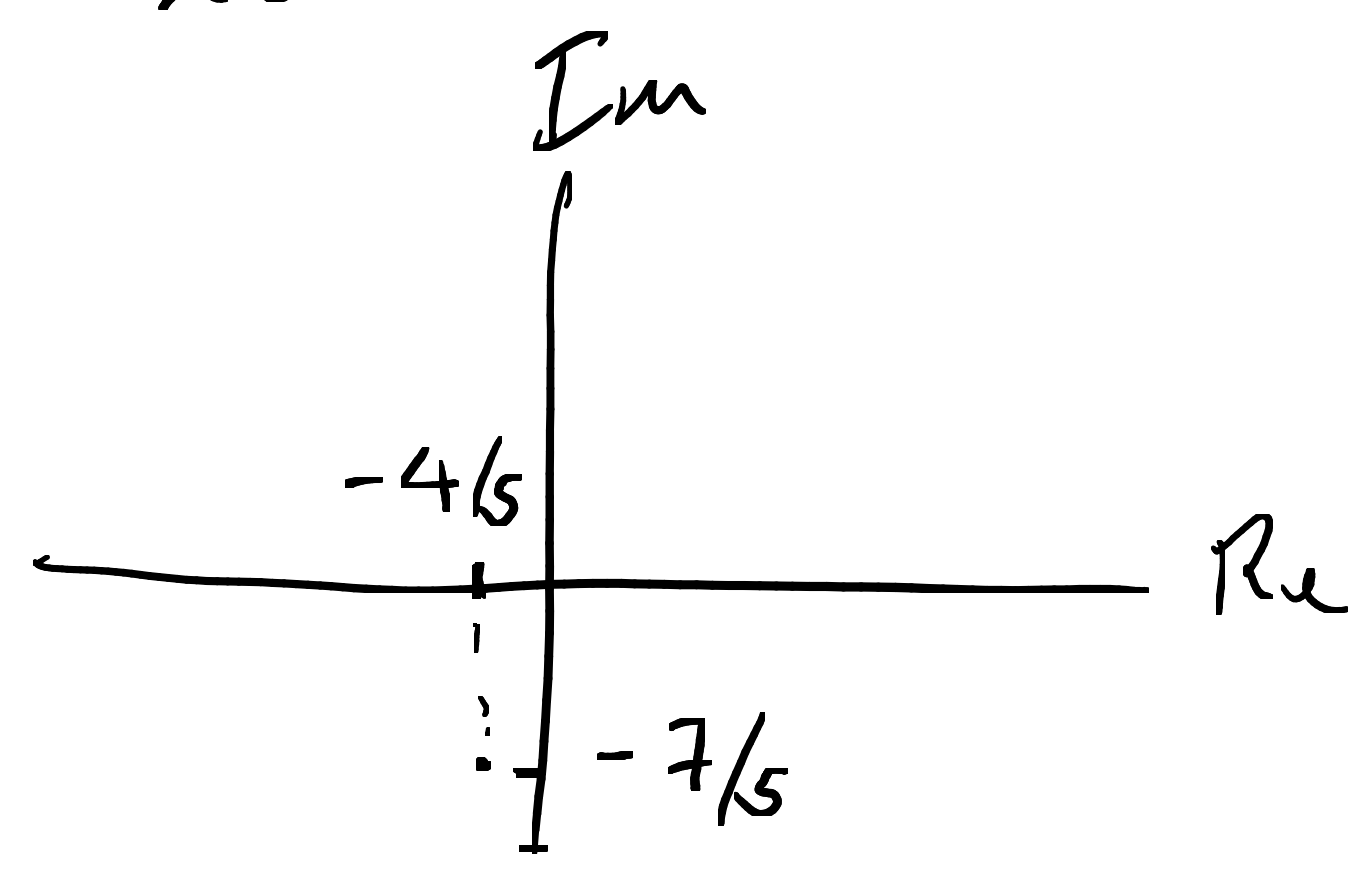


(v) $z \cdot w = 2 + i + 6 = 8 + i$



(vi)

$$\frac{w}{z} = \frac{2-3i}{1+2i} \times \frac{1-2i}{1-2i} = \frac{2-7i-6}{5} = \frac{-4-7i}{5}$$



Q 1.2

$$i) z = e^{i\pi/2} = \cos(\pi/2) + i\sin(\pi/2)$$

$$= 0 + i$$

$$ii) z = e^{-i\pi} = \cos(-\pi) + i\sin(-\pi)$$

$$= -1$$

$$iii) z = e^{1+i} = e \cdot e^i = e(\cos(1) + i\sin(1))$$

$$Q 1.3) i) x^2 - 4x + 13 = 0 \mid x = 2 \pm 3i$$

$$ii) x^2 + 2x + 2 = 0 \mid x = -1 \pm i$$

iii) ,

