

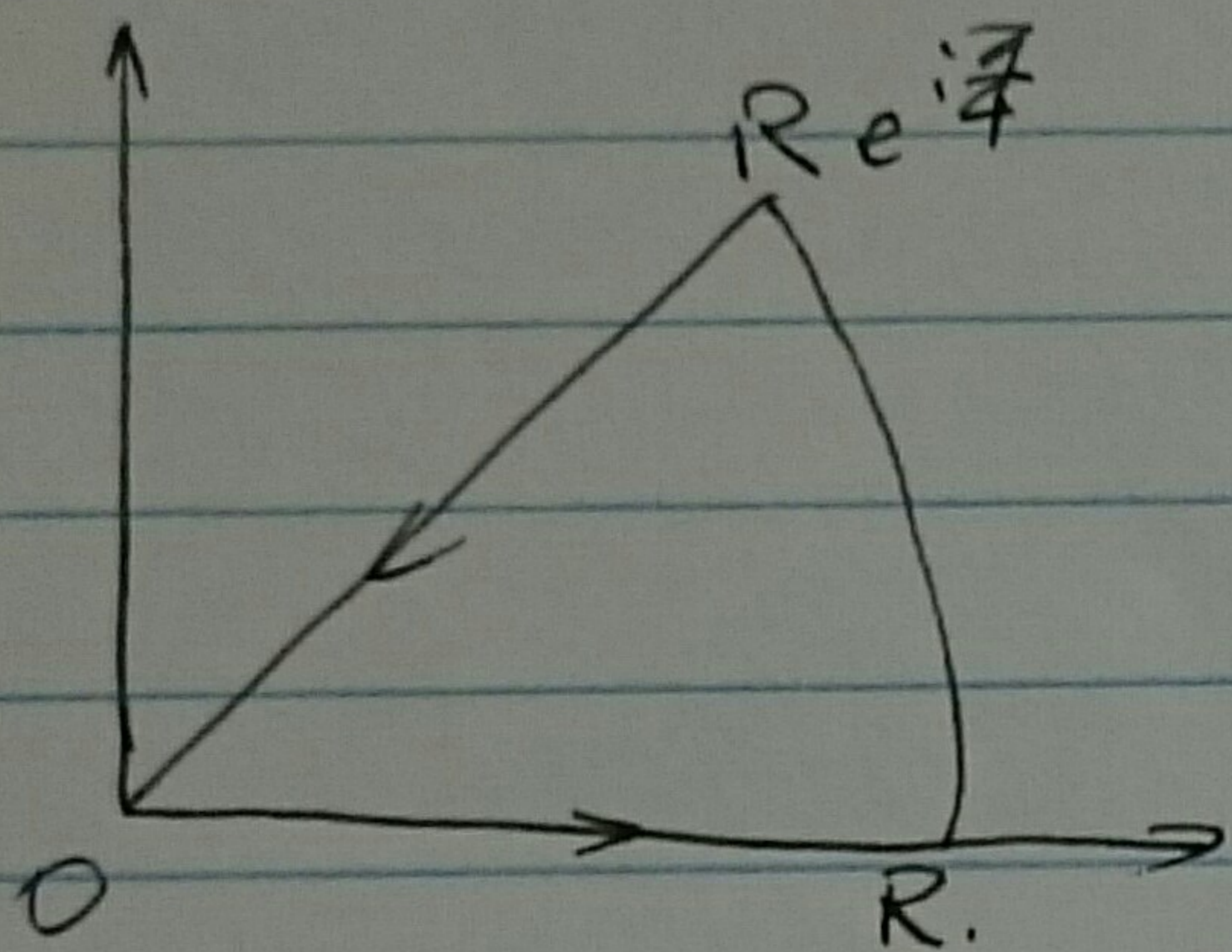
Tutorial 8. 11. Nov. 2015.

1. Show that $\int_0^{\infty} \frac{\sin x}{x} dx = \frac{\pi}{2}$

2. Prove that

$$\int_0^{\infty} \sin x^2 dx = \int_0^{\infty} \cos x^2 dx = \frac{\sqrt{2\pi}}{4}$$

Hint:



$$f(z) = e^{-z^2}$$

3. Evaluate the integrals

$$\int_0^{\infty} e^{-ax} \cos bx dx \quad \text{and} \quad \int_0^{\infty} e^{-ax} \sin bx dx \quad a > 0$$

By integrating e^{-Az} , $A = \sqrt{a^2 + b^2}$ over an appropriate sector with angle ω , with $\cos \omega = a/A$.