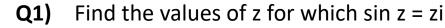
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TALHA MANSOOR

Complex Variable & Transform

3rd Semester (BE Mechanical)

Submitted to: Miss Sarwat Ishfaq.



Solution:

$$Sin z = \underline{e^{iz} - e^{-iz}}$$
zi

Given, $\sin z = zi$

$$= e^{iz} - e^{-iz} = zi x zi$$

$$= e^{iz} - \frac{1}{e^{iz}} = -4$$

$$=$$
 $(e^{iz}) - 1 = -4 e^{iz}$

=
$$(e^{iz})^2 - 1 = -4 e^{iz}$$

=
$$(e^{iz})^2 + 4e^{iz} - 1 = 0$$

$$= (e^{iz})^2 + 4e^{iz} + 4 = 5$$

$$= (e^{iz} + 2)^2 = 5$$

$$=$$
 $e^{iz} = 2 + \sqrt{5}$

= iz = 1n
$$(2+\sqrt{5})$$

=
$$z = -1 \ln (2 + \sqrt{5})$$

Solution:

Sin
$$z = \cos hy$$

Sin
$$(x + y) - \cos hy$$

Sin x coshy
$$-\cos x \sin hy - \cos hy$$

This will hold if:

Sin x cos hy
$$-\cos hy$$

$$Cos x sin hy = 0$$

Now if $\sin hy = 0$, then $\cos hy = 1$

Hence,

Sin
$$x = \cos hy = 1$$

So, no solution in this case

Now if $\cos x = 0$

$$X = \underbrace{(2x+1)}_{2} \pi$$

So, for the values of x, $\sin x = \pm 1$

Now cos hy > 0 and cos hy > 0 then we must have $\sin x = \pm 1$ and $\cos hy = \cos hy$

So, we get

$$y = \pm 4$$

$$X = \underbrace{(4n+1)}_{2} \pi$$

Hence, solution is

$$X = \underbrace{(4n+1)}_{2} \pi \pm 4i$$