

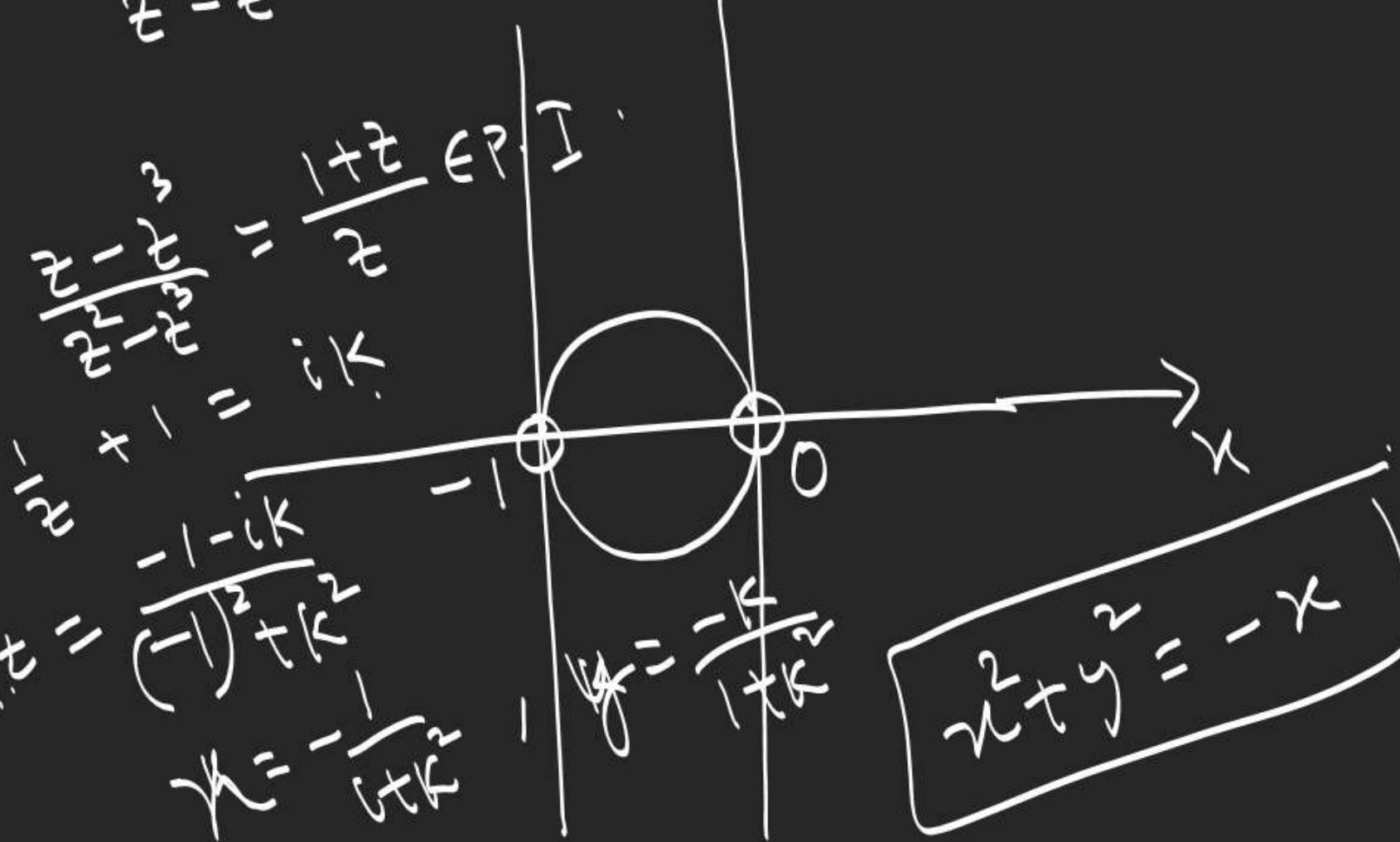
1.

Find locus of  $z$  for which triangle with vertices  $z, z^2, z^3$  is right angled.



Not possible

$$\frac{z - z^2}{z - z^3} = -z \in \mathbb{P} \cdot \mathbb{I}.$$



Q: Find the locus of point  $P(z)$  in complex plane

o.t.  $|z + \frac{1}{z}| = 2$

$$|z^2 + 1|^2 = 4|z|^2 \Rightarrow (z^2 + 1)(\bar{z}^2 + 1) = 4|z|^2$$

$$\underbrace{|z|^4 - 4|z|^2 + 1}_{(z^2 - 1)^2} + z^2 + \bar{z}^2 = 0$$

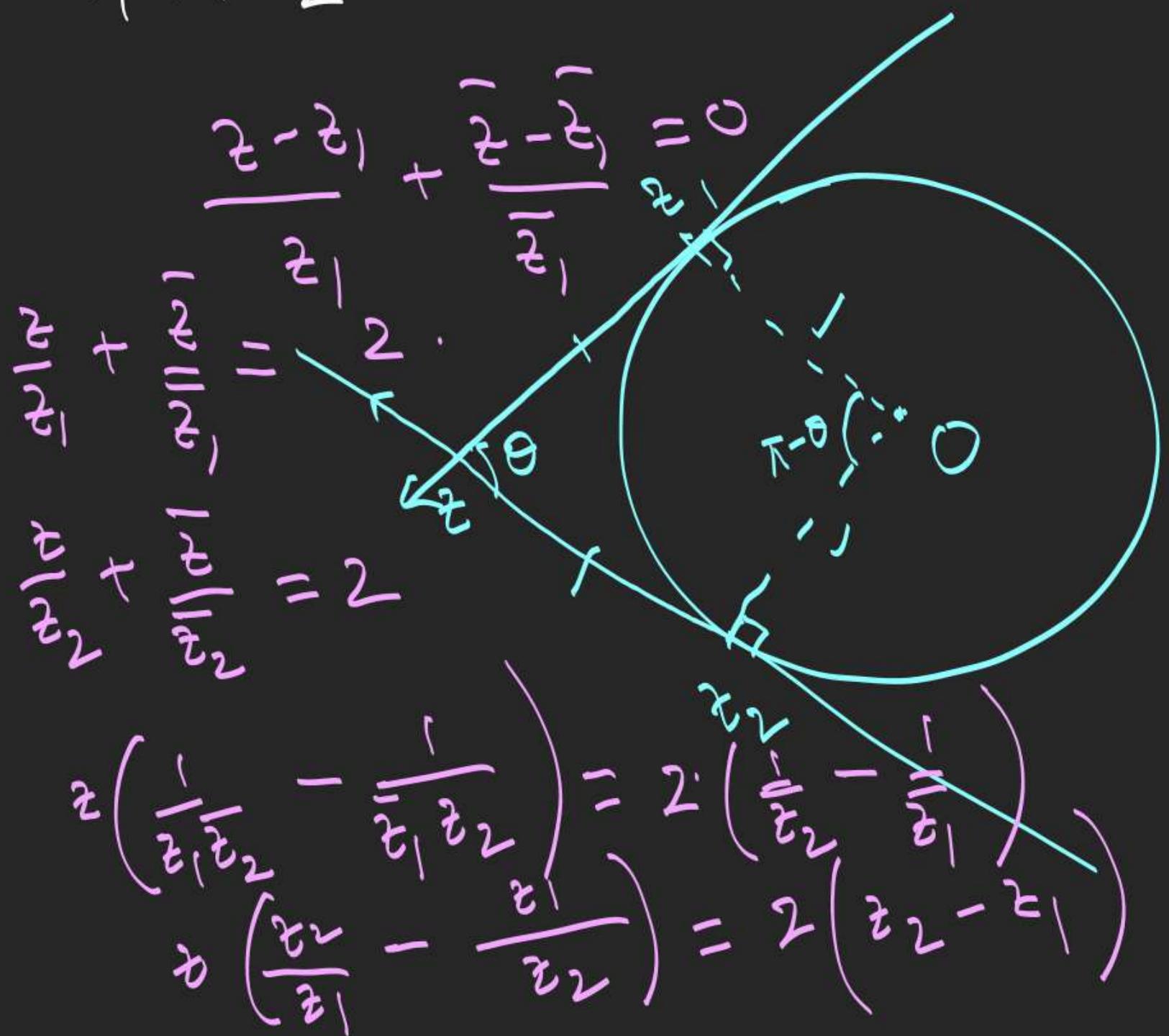
Mondays

$$(|z|^2 - 1)^2 - ((z - \bar{z})^2) = 0$$

$$(z\bar{z} - i(z - \bar{z}) - 1)(z\bar{z} + i(z - \bar{z}) - 1) = 0$$

Parabola  $\rightarrow$  (Ex-II) complete  
JEE Main & Advanced

3. Find the intersection point of tangents at points  $z_1$  &  $z_2$  on the circle  $|z|=r$  in terms of  $z_1, z_2$ .



$$z - z_1 = (z - z_2)e^{i\theta}$$

$$z_1 e^{i(\bar{\theta}-\theta)} = z_2$$

$$-z_1 e^{-i\theta} = z_2$$

$$-z(z - z_2) = z_2(z - z_1)$$

$$z = \frac{2z_1 z_2}{z_1 + z_2}$$