

1. write as $x+iy$ $\frac{1}{1+i}$, $\frac{1}{i-1}$

2. write as $re^{i\theta}$ $\frac{3+i}{2+i}$, $\left(\frac{1+i}{1-i}\right)^2$

3. Find absolute value $\frac{2}{z}$, $\frac{2+3i}{1-i}$

4. solve for x, y $x+iy = 3i-4$, $2ix+3 = y-i$

5. what points satisfy $z-\bar{z} = 2i$, $z^2 = \bar{z}^2$

6. Do these converge $\sum_{n=1}^{\infty} i^n$, $\sum_{n=1}^{\infty} \frac{(3+2i)^n}{n!}$

7. Find disk of convergence $\sum_{n=1}^{\infty} \left(\frac{3}{2}\right)^n$, $\sum_{n=1}^{\infty} \frac{3^n}{\sqrt{n}}$

8. Express in $x+iy$ form $e^{-i\pi/4}$, $(1+i\sqrt{3})^2$

9. Find all roots $z^3 = 1$, $z^4 = 1$

10. Write in rectangular form $\cos(i\ln 5)$, $\ln(\pi - i\ln 3)$

11. use $\sin \theta = \frac{e^{i\theta} - e^{-i\theta}}{2i}$, $\sinh z = \frac{e^z - e^{-z}}{2}$, show $\sin(iy) = i \cosh y$
 $\cos \theta = \frac{e^{i\theta} + e^{-i\theta}}{2}$, $\cosh z = \frac{e^z + e^{-z}}{2}$, $\frac{d}{dz} \cosh z = \sinh z$

12. Show that $x+iy = Ae^{i\omega t}$ corresponds to uniform circular motion.
Find the speed.