

Evaluate to either rectangular or polar form:

$$z = 3(4 + 2i)$$

$$z = i(4 + 2i)$$

$$z = 3i + 3(4 + 2i)$$

$$z = (3i + 3)(4 + 2i)$$

$$z = i(3i + 3)(4 + 2i)$$

$$z = \frac{3+i}{2}$$

$$z = \frac{3+i}{i}$$

$$z = \frac{3 + i}{2 + i}$$

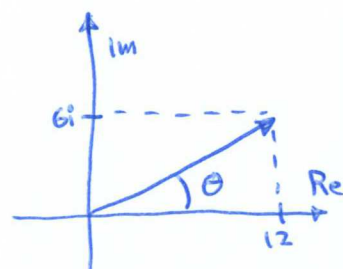
$$z = \frac{i}{1 + i} + 1$$

Evaluate to either rectangular or polar form:

$$z = 3(4 + 2i)$$

$$= 12 + 6i$$

$$\begin{aligned} z = 12 + 6i &= \sqrt{180} e^{0.464i} \\ &= 13.4 e^{0.464i} \end{aligned}$$



$$\theta = \tan^{-1}\left(\frac{6}{12}\right) = 0.464$$

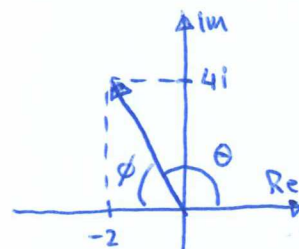
$$R = \sqrt{12^2 + 6^2} = \sqrt{180}$$

$$z = i(4 + 2i)$$

$$= 4i + 2i^2$$

$$= -2 + 4i$$

$$\begin{aligned} z = -2 + 4i &= \sqrt{20} e^{2.304i} \\ &= 4.472 e^{2.304i} \end{aligned}$$



$$\phi = \tan^{-1}\left(\frac{4}{2}\right) = 1.107$$

$$\theta = \pi - 1.107 = 2.034$$

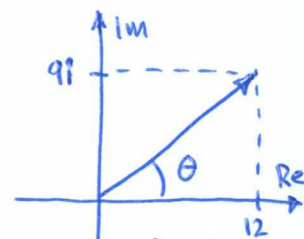
$$R = \sqrt{(-2)^2 + 4^2} = \sqrt{20}$$

$$z = 3i + 3(4 + 2i)$$

$$= 3i + 12 + 6i$$

$$= 12 + 9i$$

$$z = 12 + 9i = 15 e^{0.644i}$$

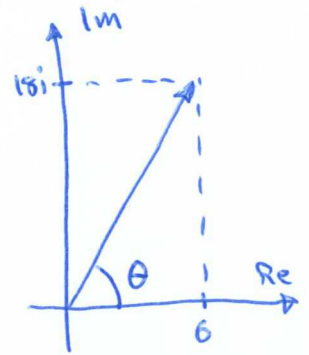


$$\theta = \tan^{-1}\left(\frac{9}{12}\right) = 0.644$$

$$R = \sqrt{12^2 + 9^2} = 15$$

$$\begin{aligned}
 z &= (3i + 3)(4 + 2i) \\
 &= 4(3i + 3) + 2i(3i + 3) \\
 &= 12i + 12 + 6i^2 + 6i \\
 &= 6 + 18i
 \end{aligned}$$

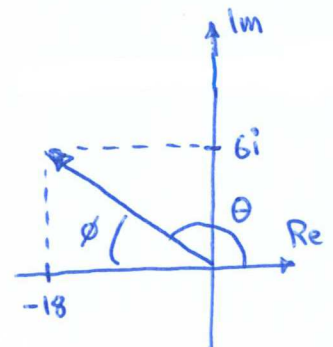
$$\begin{aligned}
 Z &= 6 + 18i = \sqrt{360} e^{1.249i} \\
 &= 18.97 e^{1.249i}
 \end{aligned}$$



$$\begin{aligned}
 \theta &= \tan^{-1}\left(\frac{18}{6}\right) = 1.249 \\
 R &= \sqrt{18^2 + 6^2} = \sqrt{360}
 \end{aligned}$$

$$\begin{aligned}
 z &= i(3i + 3)(4 + 2i) \\
 &= 4i(3i + 3) + 2i^2(3i + 3) \\
 &= 12i^2 + 12i - 6i - 6 \\
 &= -18 + 6i
 \end{aligned}$$

$$\begin{aligned}
 Z &= -18 + 6i = \sqrt{360} e^{2.820i} \\
 &= 18.97 e^{2.820i}
 \end{aligned}$$

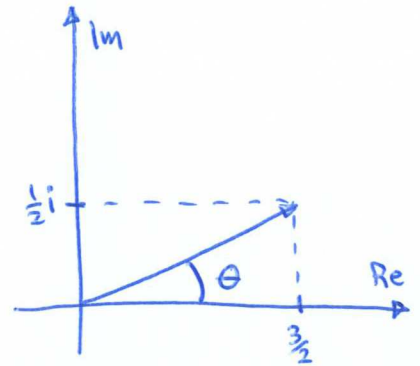


$$\begin{aligned}
 \phi &= \tan^{-1}\left(\frac{6}{18}\right) = 0.322 \\
 \theta &= \pi - 0.322 = 2.820 \\
 R &= \sqrt{(-18)^2 + 6^2} = \sqrt{360}
 \end{aligned}$$

$$z = \frac{3+i}{2}$$

$$= \frac{3}{2} + \frac{1}{2}i$$

$$\begin{aligned} \bar{z} &= \frac{3}{2} + \frac{1}{2}i = \frac{1}{2}\sqrt{10} e^{0.322i} \\ &= 1.58 e^{0.322i} \end{aligned}$$



$$\theta = \tan^{-1}\left(\frac{\frac{1}{2}}{\frac{3}{2}}\right) = 0.322$$

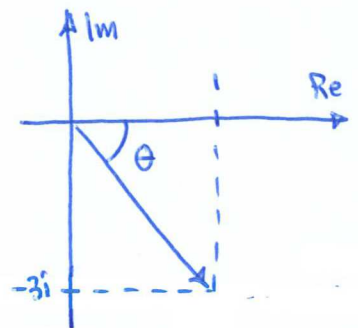
$$R = \sqrt{\left(\frac{1}{2}\right)^2 + \left(\frac{3}{2}\right)^2} = \frac{1}{2}\sqrt{10}$$

$$z = \left(\frac{3+i}{i}\right)\left(\frac{-i}{-i}\right)$$

$$= \frac{-3i - i^2}{-i^2}$$

$$= \frac{1 - 3i}{1}$$

$$\begin{aligned} \bar{z} &= 1 - 3i = \sqrt{10} e^{-1.249i} \\ &= 3.16 e^{-1.249i} \end{aligned}$$

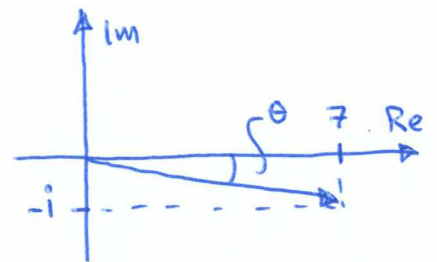


$$\theta = \tan^{-1}\left(\frac{3}{1}\right) = 1.249$$

$$R = \sqrt{1^2 + (-3)^2} = \sqrt{10}$$

$$\begin{aligned}
 z &= \left(\frac{3+i}{2+i} \right) \left(\frac{2-i}{2-i} \right) \\
 &= \frac{6 - 3i + 2i - i^2}{4 - \cancel{2i} + \cancel{2i} - i^2} \\
 &= \frac{7-i}{5}
 \end{aligned}$$

$$\begin{aligned}
 \bar{z} &= \frac{7}{5} - \frac{i}{5} = \sqrt{2} e^{-0.142i} \\
 &= 1.41 e^{-0.142i}
 \end{aligned}$$

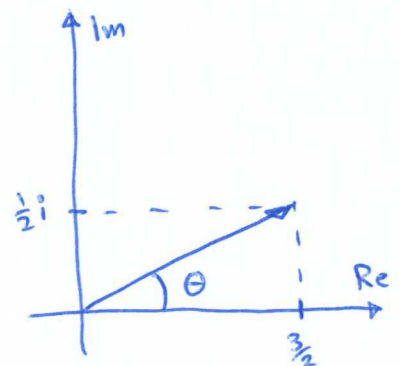


$$\theta = \tan^{-1}\left(\frac{1}{7}\right) = 0.142$$

$$R = \sqrt{\left(\frac{7}{5}\right)^2 + \left(\frac{1}{5}\right)^2} = \sqrt{2}$$

$$\begin{aligned}
 z &= \frac{i}{1+i} + 1 \\
 &= \left(\frac{i}{1+i} \right) \left(\frac{1-i}{1-i} \right) + 1 \\
 &= \frac{i - i^2}{1 - \cancel{i} + \cancel{i} - i^2} + 1 \\
 &= \frac{1+i}{2} + 1 \\
 &= \frac{1}{2} + \frac{1}{2}i + 1 \\
 &= \frac{3}{2} + \frac{1}{2}i
 \end{aligned}$$

$$\begin{aligned}
 \bar{z} &= \frac{3}{2} + \frac{1}{2}i = \frac{1}{2}\sqrt{10} e^{0.322i} \\
 &= 1.58 e^{0.322i}
 \end{aligned}$$



$$\theta = \tan^{-1}\left(\frac{1}{3}\right) = 0.322$$

$$R = \sqrt{\left(\frac{3}{2}\right)^2 + \left(\frac{1}{2}\right)^2} = \frac{1}{2}\sqrt{10}$$