

Exercise 10

If $f(x) = \frac{1+2x}{x+3}$, evaluate $f(4i)$.

Solution

Plug in $4i$ wherever x is.

$$\begin{aligned} f(4i) &= \frac{1 + 2(4i)}{(4i) + 3} \\ &= \frac{1 + 8i}{3 + 4i} \\ &= \frac{1 + 8i}{3 + 4i} \times \frac{3 - 4i}{3 - 4i} \\ &= \frac{(1 + 8i)(3 - 4i)}{(3 + 4i)(3 - 4i)} \\ &= \frac{3 - 4i + 24i - 32i^2}{9 - 12i + 12i - 16i^2} \\ &= \frac{3 + 20i + 32}{9 + 16} \\ &= \frac{35 + 20i}{25} \\ &= \frac{35}{25} + \frac{20}{25}i \\ &= \frac{7}{5} + \frac{4}{5}i \end{aligned}$$