

Exercise 40

For the following exercises, perform the indicated operation and express the result as a simplified complex number.

$$\frac{4 + \sqrt{-20}}{2}$$

Solution

Use the fact that $i = \sqrt{-1}$.

$$\begin{aligned} & \frac{4 + \sqrt{-20}}{2} \\ & \frac{4 + \sqrt{4(-1)(5)}}{2} \\ & \frac{4 + \sqrt{4}\sqrt{-1}\sqrt{5}}{2} \\ & \frac{4 + 2i\sqrt{5}}{2} \\ & \frac{1}{2}(4 + 2i\sqrt{5}) \\ & 2 + i\sqrt{5} \end{aligned}$$