So far, we have added, subtracted, and multiplied complex numbers. Can we divide them? A division problem between two complex numbers would look like this:

$$\frac{4+6i}{3-2i}$$

We want the answer to be in the form $a+bi$. Right now, the problem doesn't look like that because of the i in the denominator. Hopefully we can get rid of that problem by multiplying the whole fraction by a clever form of 1. (So that would be a fraction with the same thing on top as on the bottom.) What clever form of 1 could we multiply the fraction by to get a real number in the denominator?

1. Divide $(4+6i) \div (3-2i)$.
2. Divide $(a+bi) \div (c+di)$.

Will the answers to these division problems also be complex numbers?

1) $\frac{4+6i}{3-2i} \cdot \frac{3+2i}{3+2i} = \frac{12+8i+18i+12i^2}{3^2-(2i)^2} = \frac{26i}{13} = 2i$

2) $\frac{a+bi}{c+di} \cdot \frac{c-di}{c-di} = \frac{ac+-adi+bci-bdi^2}{c^2-(di)^2} = \frac{(ac+bd)}{c^2+d^2} + \frac{(-ad+bc)}{c^2+d^2}i$