P1.1.5

$$A + iB = (C + iD)(E + iF)$$

Hint: Compute $W = (C + D)(E - F) = (CE - DF) + (DE - CF)$

$$\begin{aligned} A + iB &= (C + iD)(E + iF) \\ &= (CE - DF) + i(DE + CF) \end{aligned}$$

Three matrix multiplication:

1.

$$W_1 = (C + D)(E - F) = (CE - DF) + (DE - CF)$$

2.

$$W_2 = (C - D)(E + F) = (CE - DF) - (DE - CF)$$

3.

$$W_3 = CF$$

$$A = \frac{W_1 + W_2}{2}$$

$$B = \frac{W_1 - W_2}{2} + 2W_3$$