

Book

powers of  $i$ :

1, 6, 2, 5, 3

1.  $(9+2i) + (1-7i)$

$$10 - 5i$$

2.  $(3-4i) + (-5-2i)$

$$-2 - 6i$$

3.  $(5-7i) - (8+2i)$

$$5 - 7i - 8 - 2i$$

$$-3 - 9i$$

5.  $3(-2+i) - 4(3-2i)$

$$-6 + 3i - 12 + 8i$$

$$-18 + 11i$$

6.  $2(-1+6i) - 3(2+5i)$

$$-2 + 12i - 6 - 15i$$

$$-8 - 3i$$

# HW Assessment

powers of  $i$

$$3. i^{27}$$

## Multiplying Complex Numbers

just like polynomials  
except  $i^2 = -1$

$$5i(3 - 7i)$$

$$15i - 35i^2$$

$$15i + 35$$

$$\boxed{35 + 15i}$$

$$(5 - 3i)(2 + 4i)$$

$$10 + 20i - 6i - 12i^2$$

$$10 + 14i + 12$$

$$\boxed{22 + 14i}$$

$$(4-2i)(4+2i)$$

$$16 + \cancel{8i} - \cancel{8i} - 4i^2$$

$$16 - 4i^2 = 16 + 4 = 20$$

$$(4-3i)^2$$

$$(4-3i)(4-3i)$$

$$16-12i-12i+9i^2$$

$$16-24i+9i^2$$

$$16-24i-9$$

$$7-24i$$

$$\begin{aligned}
 & (4 + i\sqrt{3})^2 \\
 & \overbrace{(4 + i\sqrt{3})(4 + i\sqrt{3})} \\
 & 16 + 4i\sqrt{3} + 4i\sqrt{3} + i^2\sqrt{9} \\
 & 16 + 8i\sqrt{3} + i^2\sqrt{9} \\
 & 16 + 8i\sqrt{3} - 3 \\
 & \quad \textcircled{13 + 8i\sqrt{3}}
 \end{aligned}$$

$$\begin{aligned}
 & (\sqrt{3} - \sqrt{-7})(\sqrt{3} + \sqrt{-7}) \\
 & (\sqrt{3} - i\sqrt{7})(\sqrt{3} + i\sqrt{7}) \\
 & \sqrt{9} + \cancel{i\sqrt{21}} - \cancel{i\sqrt{21}} - i^2\sqrt{49} \\
 & \sqrt{9} - i^2\sqrt{49} \\
 & 3 - -7 \\
 & \quad \textcircled{10}
 \end{aligned}$$