6. $\sqrt{25}+\sqrt{-9}=5+i\sqrt{9}$
$=5+3i$

14. $(3-5i)-(8-2i)=3-5i-8+2i$
$=(3-8)+(-5i+2i)$
$=-5-3i$

30. $(-5-i)(2+3i)=-5(2+3i)-i(2+3i)$
$=-10-15i-2i-3i^2$
$=-10-15i-2i-3(-1)$
$=-10-15i-2i+3$
$=(-10+3)+(-15i-2i)$
$=-7-17i$

36. $(5-3\sqrt{-48})(2-4\sqrt{-27})=(5-3i\sqrt{48})(2-4i\sqrt{27})=[5-3i(4\sqrt{3})][2-4i(3\sqrt{3})]=(5-12i\sqrt{3})(2-12i\sqrt{3})$
$=5(2-12i\sqrt{3})-12i\sqrt{3}(2-12i\sqrt{3})=10-60i\sqrt{3}-24i\sqrt{3}+144i^2(\sqrt{3})^2$
$=10-60i\sqrt{3}-24i\sqrt{3}+144(-1)(3)=10-60i\sqrt{3}-24i\sqrt{3}-432$
$=(10-432)+(-60i\sqrt{3}-24i\sqrt{3})=-422-84i\sqrt{3}$

40. $\frac{4-8i}{4i}=\frac{4(1-2i)}{4i}=\frac{\cancel{4}(1-2i)}{\cancel{4}i}=\frac{1-2i}{i}=\frac{1-2i}{i}\cdot\frac{i}{i}=\frac{i-2i^2}{i^2}=\frac{i-2(-1)}{-1}=\frac{i+2}{-1}=-2-i$

45. $\frac{5-i}{4+5i}=\frac{5-i}{4+5i}\cdot\frac{4-5i}{4-5i}=\frac{(5-i)(4-5i)}{(4+5i)(4-5i)}=\frac{5(4-5i)-i(4-5i)}{4(4-5i)+5i(4-5i)}=\frac{20-25i-4i+5i^2}{16-20i+20i-25i^2}$
$=\frac{20-25i-4i+5(-1)}{16-25(-1)}=\frac{20-25i-4i-5}{16+25}=\frac{(20-5)+(-25i-4i)}{16+25}=\frac{15-29i}{41}=\frac{15}{41}-\frac{29}{41}i$

54. $(2-i)^3=(2-i)(2-i)^2$
$=(2-i)[2^2+2(2)(-i)+(-i)^2]$
$=(2-i)[4-4i+i^2]$
$=(2-i)[4-4i-1]$
$=(2-i)(3-4i)$
$=2(3-4i)-i(3-4i)$
$=6-8i-3i+4i^2$
$=6-8i-3i+4(-1)$
$=6-8i-3i-4$
$=2-11i$

62. Use the Powers of *i* Theorem.
The remainder of $52 \div 4$ is 0.
$i^{-52}=\frac{1}{i^{52}}=\frac{1}{i^0}=\frac{1}{1}=1$

66. Use $a = 2$, $b = 1$, $c = 3$.

$$\frac{-b+\sqrt{b^2-4ac}}{2a} = \frac{-(1)+\sqrt{(1)^2-4(2)(3)}}{2(2)}$$
$$= \frac{-1+\sqrt{1-24}}{4}$$
$$= \frac{-1+\sqrt{-23}}{4} = \frac{-1+i\sqrt{23}}{4}$$
$$= -\frac{1}{4}+\frac{\sqrt{23}}{4}i$$

80. $i+i^2+i^3+i^4+\ldots+i^{100} = 25(i+i^2+i^3+i^4) = 25(i+(-1)+(-i)+1) = 25(0) = 0$