AAT

# HW30
## complex #s

1. a) $8+2i$

b) $7-2i-4-2i$

$\boxed{3-4i}$

c) $9+2i$

d) $1+5i-5+4i$

$\boxed{-4+9i}$

2. a) $4+6i-2i-3i^2$

$4+4i+3$

$\boxed{7+4i}$

b) $3-12i-2i+8i^2$

$3-14i-8$

$\boxed{-5-14i}$

c) $14i-6+42i^2-18i$

$-6-4i-42$

$\boxed{-48-4i}$

d) $10i^2-6i+5i-3$

$-10-i-3$

$\boxed{-13-i}$

3. a) $(3+2i)(3+2i)$

$9+6i+6i+4i^2$

$9+12i-4$

$\boxed{5+12i}$

b) $1+3(1)^2(4i)+3(1)(4i)^2+(4i)^3$

$1+12i+48i^2+64i^3$

$1+12i-48-64i$

$=\boxed{-47-52i}$

c) $(8i^2-6i+12i-9)(5-8i)$

$(-17-6i)(5-8i)$

$-85-30i+130i+48i^2$

$=\boxed{-133+106i}$

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

$=4-9i^2=\boxed{13}$

b) $(5-6i)(5+6i)$

$=25+36=\boxed{61}$

c) $(i-\sqrt{3})(-i\mp\sqrt{3})$

$=-i^2+i\sqrt{3}-i\sqrt{3}+\sqrt{9}$

$=-1+3=\boxed{2}$

5. a) $\frac{1}{2+i}\left(\frac{2-i}{2-i}\right)$

$= \frac{2-i}{4+1}$

$= \boxed{\frac{2-i}{5}}$

b) $\frac{2+i}{2-i}\left(\frac{2+i}{2+i}\right)$

$= \frac{4+4i+i^2}{4+1}$

$= \boxed{\frac{3+4i}{5}}$

c) $\frac{2+i}{3i}\left(\frac{-3i}{-3i}\right)$

$= \frac{-6i-3i^2}{-9i^2}$

$= \frac{-6i+3}{9}$

$= \boxed{\frac{-2i+1}{3}}$

d) $\frac{4+3i}{2-5i}\left(\frac{2+5i}{2+5i}\right)$

$= \frac{8+6i+20i+15i^2}{4+25}$

$= \boxed{\frac{-7+26i}{29}}$

6. a) $(x^2-36)(x+7)$

$= x^3 - 36x + 7x^2 - 252$

$= x^3 + 7x^2 - 36x - 252$

b) $x^2 - 9i^2$

$= x^2 + 9$