

HW 7 - Complex Numbers Continued

Name Key Spring 17

Find the conjugate of each expression:

1. $7 + i$

$7 - i$

2. $5 - 6i$

$5 + 6i$

3. $-3 - 2i$

$-3 + 2i$

4. $-1 + i$

$-1 - i$

Simplify each expression:

5. $5i \cdot 4i$

$20i^2$

-20

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

$15i + 6i^2$

$-6 + 15i$

7. $(3i) \cdot (-7i)$

$-21i^2$

21

8. $6(-10i - 3)$

$-60i - 18$

$-18 - 60i$

9. $i(7 - i)$

$7i - i^2$

$1 + 7i$

10. $\sqrt{-16}(1 - i)$

$4i(1 - i)$

$4i - 4i^2$

$4 + 4i$

11. $(-1 + 2i)(-4 - 4i)$

FoIL: $4 + 4i - 8i - 8i^2$

$4 - 4i + 8$

$12 - 4i$

12. $(3 - 2i)(3 + 2i)$

Box:

	3	2i	
3	9	6i	$9 + 6i - 6i + 4$
-2i	-6i	-4i^2	

13

13. $(-2 + 5i)(3 - 3i)$

FoIL: $-6 + 6i + 15i - 15i^2$

$-6 + 21i + 15$

$9 + 21i$

14. $(-5 + 3i)(-5 + 3i)$

Box:

	-5	3i	
-5	25	-15i	$25 - 15i - 15i + 9$
3i	-15i	9i^2	

$16 - 30i$

15. $\frac{-5}{6i} \cdot \frac{i}{i}$

$\frac{-5i}{6i^2}$

$\frac{-5i}{-6}$

$\frac{5i}{6}$

16. $\frac{7}{-3i} \cdot \frac{i}{i}$

$\frac{7i}{-3i^2}$

$\frac{7i}{3}$

17. $\frac{-5+7i}{5i} \cdot \frac{i}{i}$

$\frac{-5i + 7i^2}{5i^2}$

$\frac{-7 - 5i}{-5}$

$$18. \frac{-5}{2-i} \cdot \frac{(2+i)}{(2+i)} = \frac{-10-5i}{4+2i-2i-i^2}$$

$$\frac{-10-5i}{4+1}$$

$$\frac{-10-5i}{5} \text{ reduce!}$$

$$\boxed{-2+i}$$

$$19. \frac{7}{-1+6i} \cdot \frac{(-1-6i)}{(-1-6i)} = \frac{-7-42i}{1+6i-6i-36i^2}$$

$$\boxed{\frac{-7-42i}{37}}$$

$$20. \frac{-1-2i}{3+4i} \cdot \frac{(3-4i)}{(3-4i)} = \frac{-3+4i-6i+8i^2}{9-12i+12i-16i^2}$$

$$\frac{-3-2i-8}{9+16}$$

$$\boxed{\frac{-11-2i}{25}}$$

$$21. \frac{6+2i}{6-2i} \cdot \frac{(6+2i)}{(6+2i)} = \frac{36+12i+12i+4i^2}{36+12i-12i-4i^2}$$

$$\frac{36+24i-4}{36+4}$$

$$\frac{32+24i}{40} \text{ reduce!}$$

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

$$22. i^{80}$$

$$\begin{array}{r} 26 \\ 4 \overline{) 80} \\ \underline{-80} \\ 0 \end{array}$$

$$\boxed{1}$$

$$23. i^{229}$$

$$\begin{array}{r} 57 \\ 4 \overline{) 229} \\ \underline{-20} \\ 29 \\ \underline{-28} \\ 1 \end{array}$$

$$\boxed{i}$$

$$24. i^{51}$$

$$\begin{array}{r} 12 \\ 4 \overline{) 51} \\ \underline{-4} \\ 11 \\ \underline{-8} \\ 3 \end{array}$$

$$\boxed{-i}$$

$$25. i^{70}$$

$$\begin{array}{r} 17 \\ 4 \overline{) 70} \\ \underline{-4} \\ 30 \\ \underline{-28} \\ 2 \end{array}$$

$$\boxed{-1}$$