2.4 Complex Conjugates Day 2

I. Complex Conjugates--a + bi, a - bi

Find the conjugate and multiply.

Ex 1) $(7 - 5i)(7+5i)$

$49 - 25i^2$

$49 + 25 = \boxed{74}$

Ex 2) $(-6 - \sqrt{5}i)(-6+\sqrt{5}i)$

$36 - 5i^2$

$36 + 5 = \boxed{41}$

II. Write the quotient in standard form.

Ex 3) $\dfrac{(2 + 3i)(4+2i)}{(4 - 2i)(4+2i)} = \dfrac{8+16i+6i^2}{16-4i^2} = \dfrac{8+16i-6}{16+4}$

$= \dfrac{2+16i}{20} \div 2 = \dfrac{1+8i}{10} = \dfrac{1}{10} + \dfrac{8i}{10} = \boxed{\dfrac{1}{10} + \dfrac{4}{5}i}$

Ex 4) $\dfrac{6}{i} \cdot \dfrac{i}{i} = \dfrac{6i}{i^2} = \boxed{-6i}$ or $\boxed{0-6i}$

III. Perform the operation and write in standard form.

Ex 5) $\dfrac{i}{3-2i} + \dfrac{2i}{3+2i}$

$= \dfrac{i(3+2i)}{(3-2i)(3+2i)} + \dfrac{2i(3-2i)}{(3-2i)(3+2i)} = \dfrac{3i+2i^2+6i-4i^2}{(3-2i)(3+2i)}$

$\dfrac{2+9i}{(3-2i)(3+2i)} = \dfrac{2+9i}{9-4i^2} = \dfrac{2+9i}{9+4} = \dfrac{2+9i}{13}$

$= \dfrac{2}{13} + \dfrac{9}{13}i$