Section 5-10: Simplifying Complex expressions

$$(15+3i)(15-3i)$$

F O I L

$$225 - 45i + 45i - 9i^2$$

$$225 - 9(-1)$$

$$225 + 9 = 234$$

$(15+3i)$ and $(15-3i)$ are examples of complex conjugates. The general form is $(a+bi)(a-bi)$. You always end up with a real #.

ex a Find conjugate of $3+8i \rightarrow 3-8i$

" " $12-3i \rightarrow 12+3i$

" " $7i \rightarrow -7i$

" " $-5i \rightarrow 5i$

ex.) $\frac{8i}{(1+3i)} \cdot \frac{(1-3i)}{(1-3i)} = \frac{8i-24i^2}{1-9i^2}$

$= \frac{8i+24}{1+9}$

$= \frac{8i+24}{10}$

$= \frac{4i+12}{5}$

ex.) $\frac{(2+i)}{5i} \cdot \frac{i}{i} = \frac{2i+i^2}{5i^2}$

$= \frac{2i+-1}{-5}$

$= \frac{-2i+1}{5}$

Assignment: p. 320 # 16-42E, 50, 54
58 is e.c.