

# Warmup: Conjugate of denominator

FOIL

$$\frac{(6 + 2i)}{1 - 3i} \cdot \frac{(1 + 3i)}{(1 + 3i)}$$

$$= \frac{6 + 18i + 2i + 6i^2}{1^2 + (-3)^2} = \frac{6 + 20i - 6}{1 + 9}$$

$$= \frac{20i}{10} = 2i$$

$$\frac{2 + 3i}{-1 + 4i}$$

$$\frac{(2 + 3i)}{-1 + 4i} \cdot \frac{(-1 - 4i)}{(-1 - 4i)} = \frac{(-2 - 8i - 3i - 12i^2)}{(-1)^2 + (-4)^2}$$

$$= \frac{10 - 11i}{1 + 16}$$

Simplify.

$$1) \frac{8-4i}{-8+6i} \cdot \frac{-8-6i}{-8-6i}$$

$$= \frac{-64 - 48i + 32i + 24i^2}{64 + 36} = \frac{-64 - 16i - 24}{100} = \frac{-88 - 16i}{100} = \frac{-22 - 4i}{25}$$

$$3) \frac{-9+6i}{5i} \cdot \frac{-5i}{-5i} = \frac{45i - 30i^2}{25} = \frac{45i + 30}{25}$$

$$= \frac{9i + 6}{5}$$

$$2) \frac{3+3i}{-10i} \cdot \frac{10i}{10i} = \frac{30i + 30i^2}{100} = \frac{30i - 30}{100}$$

$$\frac{3i - 3}{10}$$

$$4) \frac{-8-8i}{10+3i} \cdot \frac{(10-3i)}{(10-3i)} = \frac{-80 + 24i - 80i + 24i^2}{100 + 9}$$

$$= \frac{-80 - 56i - 24}{109} = \frac{-104 - 56i}{109}$$

$$5) \frac{3+7i}{-3-i} \cdot \frac{-3+i}{-3+i} = \frac{-9+3i-21i+7i^2}{9+1}$$

$$= \frac{-9-18i-7}{10} = \frac{-16-18i}{10}$$

$$= \frac{-8-9i}{5}$$

$$7) \frac{1+3i}{-4i} \cdot \frac{4i}{4i} = \frac{4i+12i^2}{16}$$

$$= \frac{4i-12}{16}$$

$$= \frac{i-3}{4}$$

$$6) \frac{9-9i}{9-5i} \cdot \frac{9+5i}{9+5i} = \frac{81+45i-81i-45i^2}{81+25}$$

$$= \frac{81-36i+45}{106} = \frac{126-36i}{106}$$

$$= \frac{63-18i}{53}$$

$$8) \frac{-4-9i}{-8+3i} \cdot \frac{-8-3i}{-8-3i} = \frac{32+12i+72i+27i^2}{64+9}$$

$$= \frac{32+84i-27}{73}$$

$$= \frac{5+84i}{73}$$

$$9) \frac{-1-8i}{-6-9i} \cdot \frac{-6+9i}{-6+9i} = \frac{6-9i+48i-72i^2}{36+81}$$

$$= \frac{6+39i+72}{117} = \frac{78+39i}{117}$$

$$= \frac{2+i}{3}$$

$$10) \frac{-9+8i}{4+i} \cdot \frac{4-i}{4-i} = \frac{-36+9i+32i-8i^2}{16+1}$$

$$= \frac{-36+41i+8}{17} = \frac{-28+41i}{17}$$

# Chain Activity

# Kahoot

<https://play.kahoot.it/#/k/8bd27620-622d-4b58-82a9-1ccd3eda99c4/intro>

HW #6

Dividing Complex Numbers