

How do we multiply complex numbers?

Do Now Multiply  $* i^2 = -1$

$$1) (2i)(i) = 2i^2 = 2(-1) = -2$$

$$2) \overbrace{3i}^M (4 - 2i) = 12i - 6\overbrace{i^2}^{-1} = 12i + 6 = 6 + 12i$$

$$3) (3i)^3 = 3^3 i^3 = 27i^3 = \boxed{-27i}$$

$$= 27i^2 i$$

$$4) (2 - i)(2 + i) = 4 + 2i - 2i - i^2 = 4 + 1 = 5$$

$$5) (1-i)^2 \neq 1^2 - i^2$$

$$= (1-i)(1-i)$$

$$= 1 - i - i + i^2 = 1 - 2i - 1 = -2i$$

$$6) (1-i)^3 = \underbrace{(1-i)(1-i)}_{-2i} (1-i)$$

$$= -2i(1-i)$$

$$= -2i + 2i^2 = -2i - 2 = -2 - 2i$$

$$0 \rightarrow i^0 = 1$$

$$.25 \rightarrow i^1 = i$$

$$.5 \rightarrow i^2 = -1$$

$$.75 \rightarrow i^3 = -i$$

$$i^4 = 1$$

$$i^5 = i$$

$$i^6 = -1$$

$$i^7 = -i$$

$$i^8 = 1$$

$$i^9 = i$$

$$i^{10} = -1$$

$$i^{11} = -i$$

$$i^4 = i^2 \cdot i^2 = (-1)(-1)$$

$$i^{20} = 1$$

$$i^{\underline{2015}} =$$

$$-i$$

$$\frac{2015}{4} = 503.75$$

$$i^{2012} i^3 = i^{2015} = -i$$