

### 3.1c SOS & Quadratic Forms

SOS: sum of squares

recall  
 $i^2 = -1$

$$a^2 + b^2 = (a + bi)(a - bi)$$

factor  
Ex.1  $x^2 + 4$

$$(x + 2i)(x - 2i)$$

check  
 $(x + 2i)(x - 2i)$   
 $x^2 - 2ix + 2ix - 4i^2$   
 $x^2 - 4(-1)$   
 $x^2 + 4$

Ex.2  $9x^2 + 25$

$$(3x + 5i)(3x - 5i)$$

Quadratic Form  
higher order trinomials that factor like quadratics.

Ex.1  $x^6 - 5x^3 - 24$

$a=1$   
 $b=-5$   
 $c=-24$

<del>3</del>	<del>-24</del>	1	-24
<del>1</del>	<del>-8</del>	2	-12
		3	-8
		4	-6

$$(x^3 + 3)(x^3 - 8)$$