

Factoring Sum of Squares WS

Name key

Factor each of the following completely

$$* i^2 = -1$$

① $x^2 + 100$

$$(x^2 - -100)$$

$$(x^2 - i^2 100)$$

$$(x - 10i)(x + 10i)$$

④ $2x^2 + 98$

$$2(x^2 + 49)$$

$$2(x - 7i)(x + 7i)$$

② $x^2 + 81$

$$x^2 - -1(81)$$

$$x^2 - i^2(81)$$

$$(x - 9i)(x + 9i)$$

③ $x^2 + 16$

$$(x - 4i)(x + 4i)$$

⑤ $3x^2 + 108$

$$3(x^2 + 36)$$

$$3(x + 6i)(x - 6i)$$

⑥ $121 + x^2$

$$(11 - xi)(11 + xi)$$

⑦ $16x^2 + 121$

① $(4x - 11i)(4x + 11i)$

⑧ $9x^2 + 225$

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

⑨ $20x^2 + 405$

$$5(4x^2 + 81)$$

$$5(2x + 9i)(2x - 9i)$$

⑩ $242 + 32x^2$

$$2(121 + 16x^2)$$

$$2(11 - 4xi)(11 + 4xi)$$

⑪ If one factor of a real ^{polynomial} ~~number~~ is $(2x - 3i)$, what is the polynomial?

$$2x - 3i \rightarrow \boxed{2x + 3i}$$

⑫ Find a polynomial function with real coefficients given $(7+i)$ is a factor.

$$2x(7+i)(7-i)$$

$$49 - 7i + 7i - i^2$$

$$49 + i^2$$

$$49 + 1 = 50$$

$$2x(50) = 100x$$