

NOTES COMPLEX NUMBERS AND SQUARE ROOT PROPERTY PART 2

Find a number that when squared will give you the result of -1 :

$$i \times i = i^2 = -1$$

$$i^2 = \sqrt{-1}$$

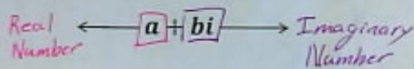
$$i = \sqrt{-1}$$

Simplify:

1. $\sqrt{-4} = \sqrt{2^2 \cdot (-1)} = 2i$ 2. $\sqrt{-32} = \sqrt{16 \cdot 2 \cdot (-1)} = 4i\sqrt{2}$ 3. $\sqrt{-45} = 3i\sqrt{5}$ 4. $-2 + \sqrt{-18} = -2 + 3i\sqrt{2}$ 5. $\sqrt{-48} = 4i\sqrt{3}$

Complex Number: $= 4i\sqrt{2}$

Definition: Part Real and part Imaginary



Complex number operations:

6. $(3-1) + (2+3i)$
 $= 2 + 2i$

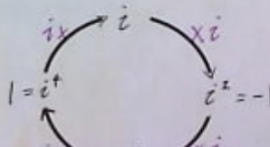
7. $(-5+3i) + (-2-8i)$

8. $(6-5i) + (1+2i)$
 $= 7 - 3i$

9. $(-6+5i) + (3-9i)$
 $= -3 - 4i$

Multiplying Imaginary:

$i^2 = i \cdot i = -1$
 $i^3 = i^2 \cdot i = (-1) \cdot i = -i$
 $i^4 = i^3 \cdot i = -i \cdot i = 1$
 $i^5 = i^4 \cdot i = 1 \cdot i = i$



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Multiplying Complex Numbers:

10. $3i(-7+i)$

$$= -21i + 3i^2$$

$$= -21i + 3(-1)$$

$$= -21i - 3$$

11. $(8-2i)(-6+5i)$

$$= -48 + 40i$$

$$+ 12i - 10i^2$$

$$= -48 + 52i - 10(-1)$$

$$= -48 + 52i + 10$$

$$= -38 + 52i$$

12. $(4+3i)(4-3i)$

Solve using square root property:

21. $2x^2 - 3 = -93$

$$+3 \quad +3$$

$$\frac{2x^2}{2} = \frac{-90}{2}$$

$$\sqrt{x^2} = \sqrt{-45}$$

$$x = \pm 3i\sqrt{5}$$

22. $3x^2 - 150 = -282$

23. $3(x-3)^2 - 2 = -26$

$$+2 \quad +2$$

$$\frac{3(x-3)^2}{3} = \frac{-24}{3}$$

$$\sqrt{(x-3)^2} = \sqrt{-8}$$

$$x-3 = \pm 2i\sqrt{2}$$

$$+3 \quad +3$$

$$x = 3 \pm 2i\sqrt{2}$$