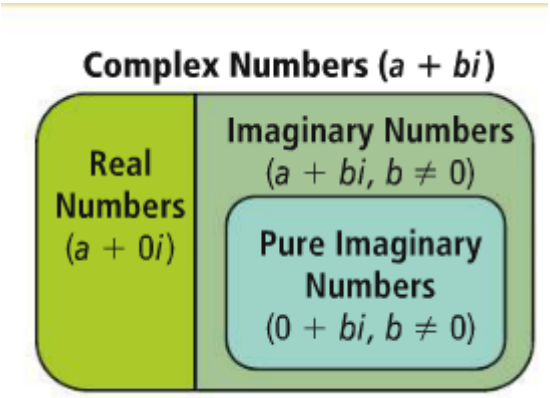
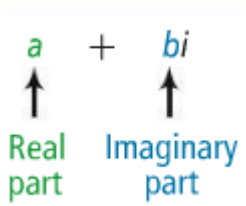
Aim: What are complex numbers? (Section 4-8)

Do Now: What are the roots for $5x^2+20$?

I- Complex Numbers





1- Powers i

The **imaginary unit** i is the complex number whose square is -1. So, $i^2 = -1$, and $i = \sqrt{-1}$.

2) Circle of answers

3) **Simplify each number by using the imaginary number *i*.**

1. $\sqrt{-100}$ **2.** $\sqrt{-2}$ **3.** $\sqrt{-48}$ **4.** $\sqrt{-36}$

$\sqrt{-1 \times 100}$

$\sqrt{-1} \times \sqrt{100}$

II – Graphing Complex Numbers

Plot each complex number and find its absolute value.

5. $5i$ **6.** $3 + 2i$ **7.** $7 - 1i$ **8.** $-4 + 9i$

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III – Operations with Complex Numbers

1- **Simplify each expression.**

9. $(9 + 6i) + (2 - i)$

$(9 + 2) + (6i - i)$

10. $(-12i) - (3 + 3i)$

11. $(-2i)(5 + 4i)$

Write each quotient as a complex number.

12. $\frac{5+4i}{7i}$

$\frac{5+4i}{7i}\left(\frac{-7i}{-7i}\right)$

13. $\frac{-1+5i}{3-2i}$

14. $\frac{2-6i}{2-3i}$

15. Error Analysis Robert solved the equation $2x^2 + 16 = 0$. His solution was $x = \pm\sqrt{-8}i$. What errors did Robert make? What is the correct solution?