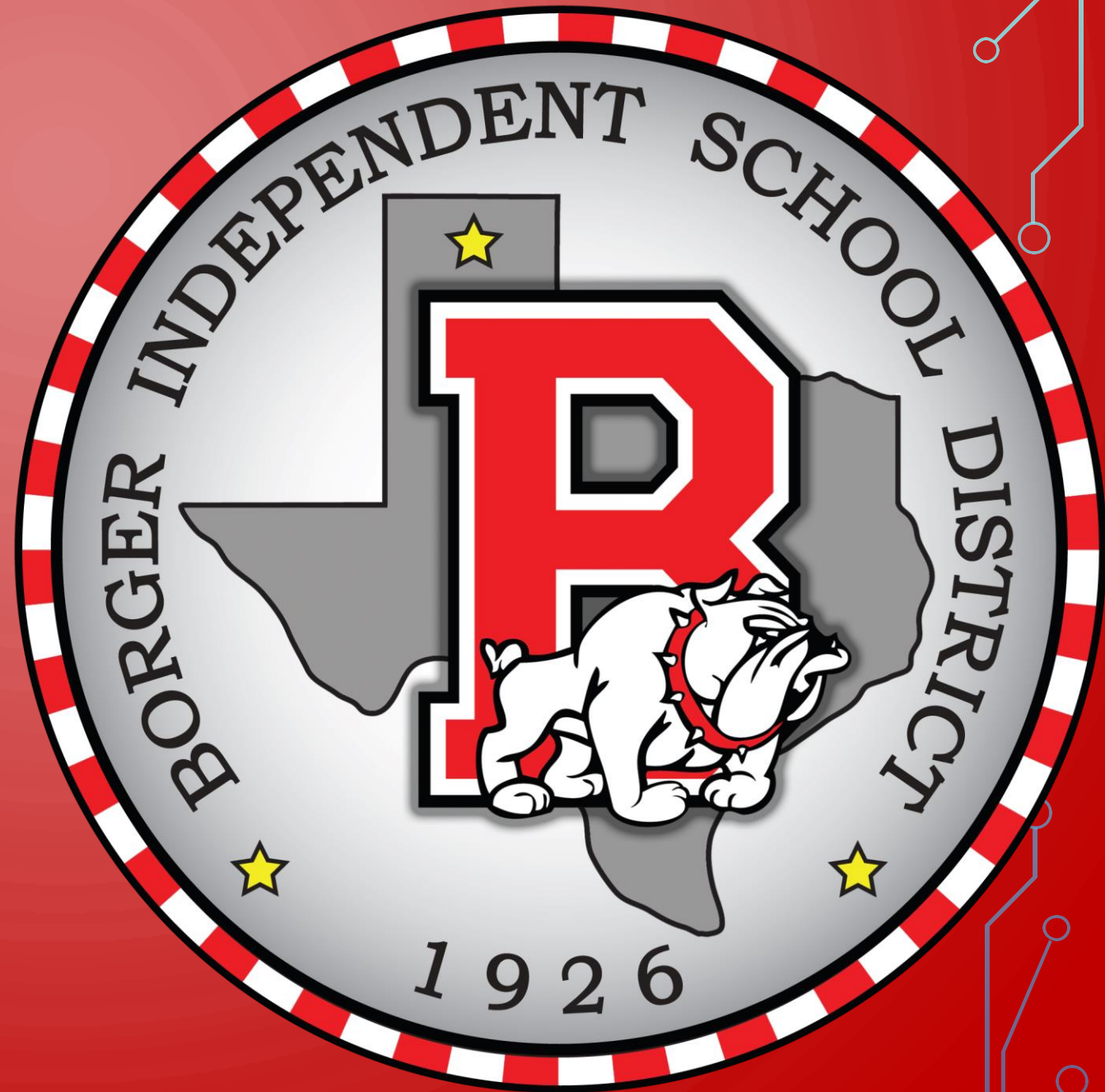


BOARD NOTES

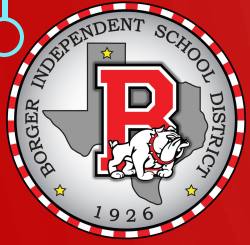
3 MARCH 2020





2A.7 (A) add, subtract, and multiply complex numbers;

We will be able to add, subtract, and multiply complex numbers.



WHAT WE NEED:

- TI-84
- Definition of imaginary

I WILL BE ABLE TO COMPLETE MY HOMEWORK GIVEN THE

- Equation

Complex Numbers and Imaginary Numbers

The **imaginary unit** i is defined as

$$i = \sqrt{-1}, \text{ where } i^2 = -1.$$

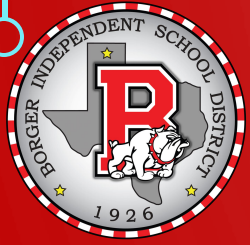
The set of all numbers in the form

$$a + bi,$$

with real numbers a and b , and i , the imaginary unit, is called the set of **complex numbers**.

The **standard form** of a complex number is

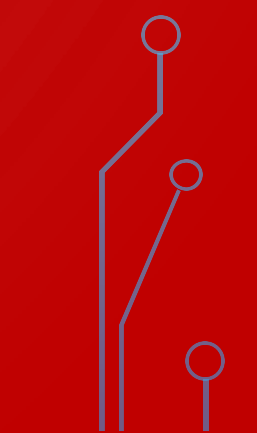
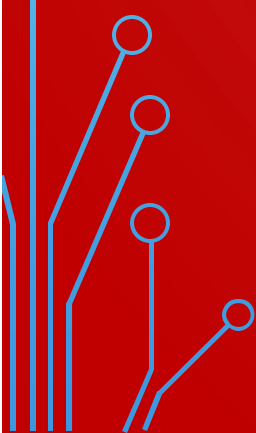
$$a + bi.$$





Operations on Complex Numbers

The form of a complex number $a + bi$ is like the binomial $a + bx$. To add, subtract, and multiply complex numbers, we use the same methods that we use for binomials.





$$\begin{aligned} & \sqrt{-64} - \sqrt{-25} \\ &= \sqrt{(-1)64} - \sqrt{(-1)25} \\ &= i\sqrt{64} - i\sqrt{25} \\ &= 8i - 5i \\ &= \boxed{3i} \end{aligned}$$

$$\begin{aligned} \sqrt{-1} &= i & a+bi \\ i^2 &= -1 \end{aligned}$$

$$\begin{aligned} & (2-3i)(5+i) \\ &= (2)(5) + (2)(i) + (-3i)(5) + (-3i)(i) \\ &= 10 + 2i - 15i - 3i^2 \\ &= 10 - 13i - 3(-1) \\ &= \boxed{13 - 13i} \end{aligned}$$

Contributing Citizen - Students will contribute energy, time, and talent to improve the quality of education and citizenry. They will display a sense of social responsibility and commitment to the democratic process. They will respect diversity and integrity, share ideas and information, and take personal responsibility for their actions.

... problems arising in everyday life, society, and the workplace

problems arising in everyday life, society, and the workplace



$$(a+b)^2 = a^2 + 2ab + b^2$$

$$\begin{aligned}(2+i\sqrt{3})^2 &= (2+i\sqrt{3})(2+i\sqrt{3}) \\ &= 4 + 4i\sqrt{3} + 3i^2 \\ &= \boxed{1 + 4i\sqrt{3}}\end{aligned}$$

$$-\sqrt{3} \cdot \sqrt{3} \cdot i \cdot i$$

$$\begin{aligned}2(-3+2i) + 3(-5-2i) \\ &= -6 + 4i - 15 - 6i \\ &= \boxed{-21 - 2i}\end{aligned}$$

$$\begin{aligned}-6(2-i\sqrt{5}) - 3(4-3i\sqrt{2}) \\ &= -12 + 6i\sqrt{5} - 12 + 9i\sqrt{2} \\ &= -24 + (6\sqrt{5} + 9\sqrt{2})i\end{aligned}$$

$$(6i)^2 = 6^2 i^2 = -36$$

$$(-5i)(3i) = -15i^2 = 15$$

$$\begin{aligned}-\sqrt{25} \cdot \sqrt{-4} &= i\sqrt{25} \cdot i\sqrt{4} \\ &= \cancel{\sqrt{(-25)(-4)}} = 5i \cdot 2i \\ &= \cancel{-100} = -10 \\ &= 10\end{aligned}$$



$$\overset{a}{(1+3i)}\overset{b}{(1-3i)} = a^2 + b^2 = 1^2 + 3^2 = 10$$

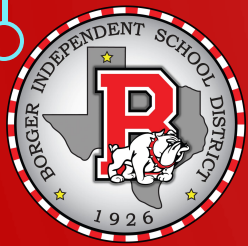
$$(1)(1) + (1)(-3i) + (3i)(1) + (3i)(-3i)$$

$$1 - 9i^2$$

$$1 - 9(-1)$$

$$10$$

$$(a+bi)(a-bi)$$



$$(8+ai)(8-ai)=64$$

$$(-10i)(10i)=100$$

$$(-3-2i\sqrt{3})(-3+2i\sqrt{3})=9+12=21$$

$$a=-3$$

$$b=2\sqrt{3}$$

$$(-3)^2 + (2\sqrt{3})^2$$

$$9 + (2^2)(\sqrt{3})^2$$