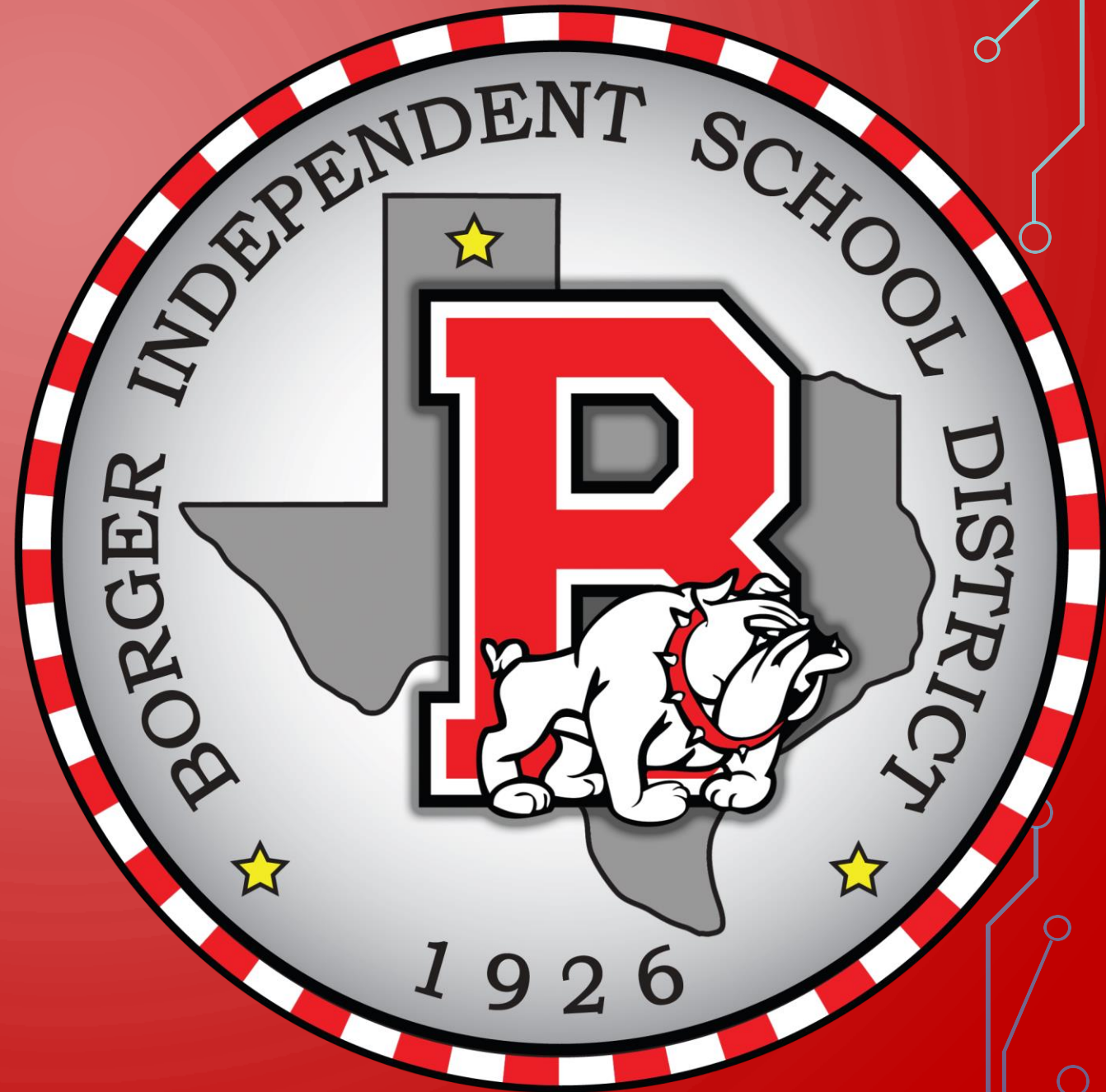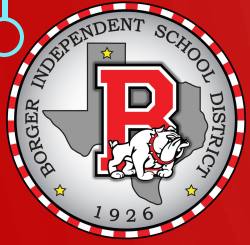# BOARD NOTES

2 MARCH 2020

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

We will be able to add and subtract 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
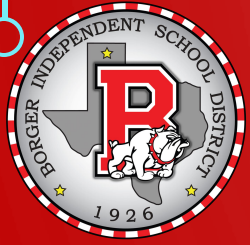
$$i = \sqrt{-1}, \text{ where } i^2 = -1.$$

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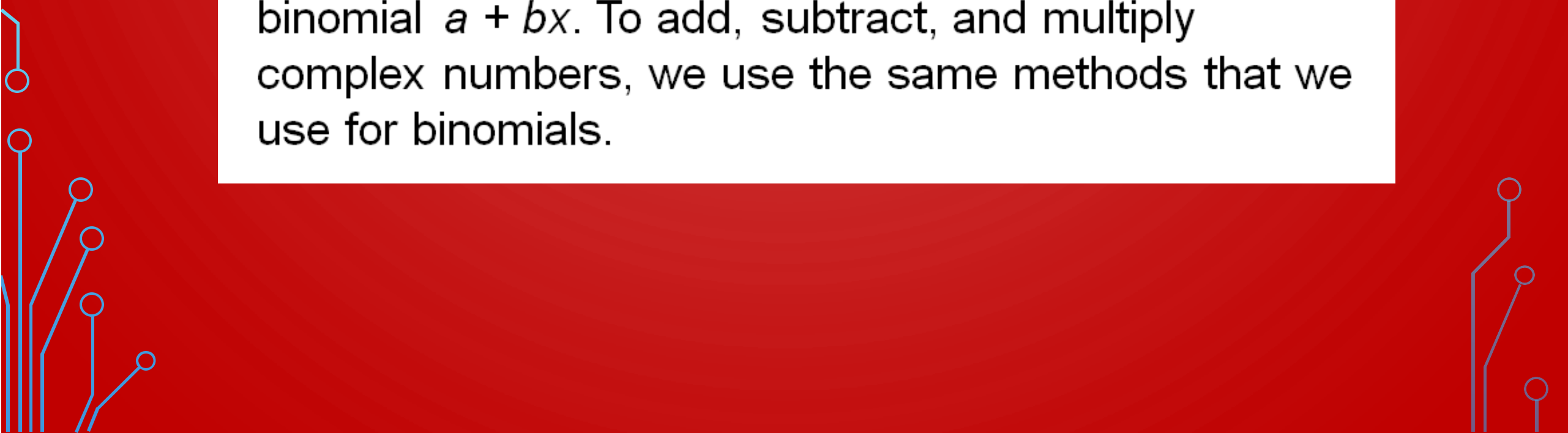
The **standard form** of a complex number is

$$a + bi.$$

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.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

QUADRATIC FORMULA

$$b^2 - 4ac$$

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

$$a + bi$$

REAL   IMAGINARY

COMPLEX ($\mathbb{C}$)

$(6+3i) + (2+8i)$

$(6+2) + (3+8)i$

$$\boxed{8 + 11i}$$

$(7+3i) + (3-3i) = 10 - 0i$

$(7+3) + (3-3)i$ OR

               10

$(4-2i\sqrt{3}) + (1-3i\sqrt{3}) = 5 - 5i\sqrt{3}$

$(5+2i) - (2+2i) = 3 + 0i$

$(5-2) + (2-2)i$ OR

            3

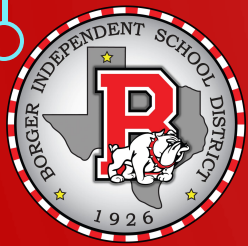$(7-3i) - (3-3i) = 4 + 0i$

$(7-3) + (-3 \underset{+}{-} -3)i$ OR

              4

$$\sqrt{-18} - \sqrt{-8}$$

$$= \sqrt{(-1)18} - \sqrt{(-1)8}$$

$$= i\sqrt{18} - i\sqrt{8}$$

$$= i\sqrt{9 \cdot 2} - i\sqrt{4 \cdot 2}$$

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

$$= i\sqrt{2}$$

$\sqrt{2}i$ Don't Do This

$$\sqrt{-27} - \sqrt{-48}$$

$$= 3i\sqrt{3} - 4i\sqrt{3}$$

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

$$\frac{-25 + \sqrt{-50}}{15}$$

$$= \frac{-25 + i\sqrt{25 \cdot 2}}{15}$$

$$= \frac{-25 + 5i\sqrt{2}}{15}$$

$$= \frac{-5 + i\sqrt{2}}{3}$$

$$\frac{-14 + \sqrt{-12}}{2} = -7 + i\sqrt{3}$$

R1 i

R2 $i^2 = -1$

R3 $i^3 = -i$

R0 $i^4 = 1$

$$i^{521} = i$$

$$i^{2048} = 1$$

$$4\overline{\smash{)}521} \quad \frac{130.25}{}$$

$$\frac{1}{4}$$

$$4\overline{\smash{)}2048} \quad \frac{512}{}$$

$$2x + 3yi = 6 + 2i \rightarrow 2x = 6$$
$$3y = 2$$

$$(x + 2y) + (2x - y) = 5 + 5i$$

$$\begin{bmatrix} 1 & 2 & | & 5 \\ 2 & -1 & | & 5 \end{bmatrix}$$