BOARD NOTES

31 OCTOBER 2019

2A.7 (B) add, subtract, and multiply polynomials;
2A.7 (C) determine the quotient of a polynomial of degree three and of degree four when divided by a polynomial of degree one and of degree two;
2A.7 (D) determine the linear factors of a polynomial function of degree three and of degree four using algebraic methods;

We will be able to use long or synthetic division to determine the quotient of a polynomial.

WHAT WE NEED:

- Definition of polynomial
- Laws of Exponents
- Addition and Subtraction of Polys
- Multiplication of Polys

I WILL BE ABLE TO COMPLETE MY HOMEWORK GIVEN THE

- Function

Special Products

There are several products that occur so frequently that it's convenient to memorize the form, or pattern, of these formulas. If *A* and *B* represent real numbers, variables, or algebraic expressions, then:

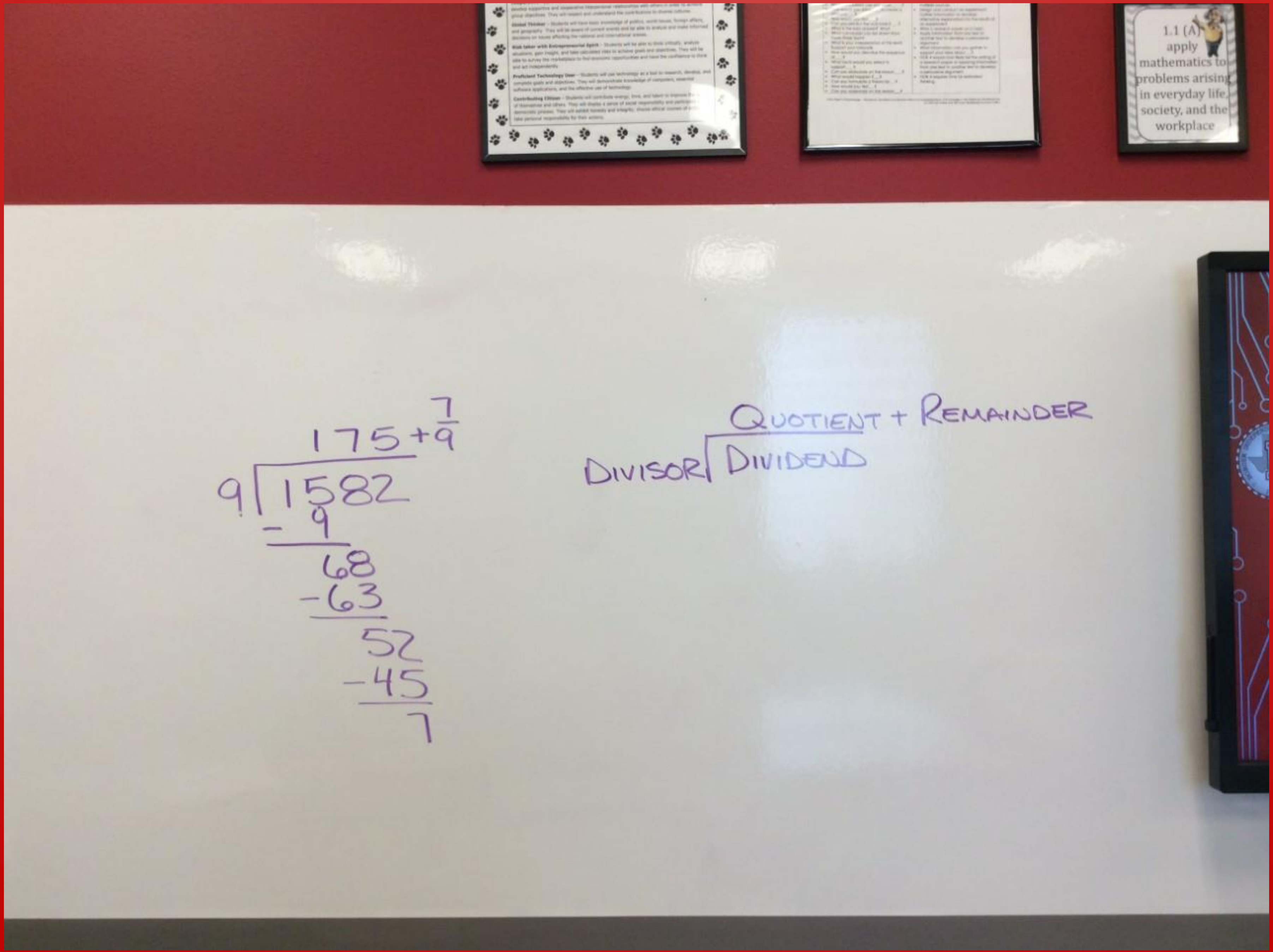
$(A+B)(A-B)=A^2-B^2$	Product of the Sum and Difference of Two Terms
$(A+B)^2=A^2+2AB+B^2$	Squaring a Binomial
$(A-B)^2=A^2-2AB+B^2$	

Division Algorithm for Polynomials

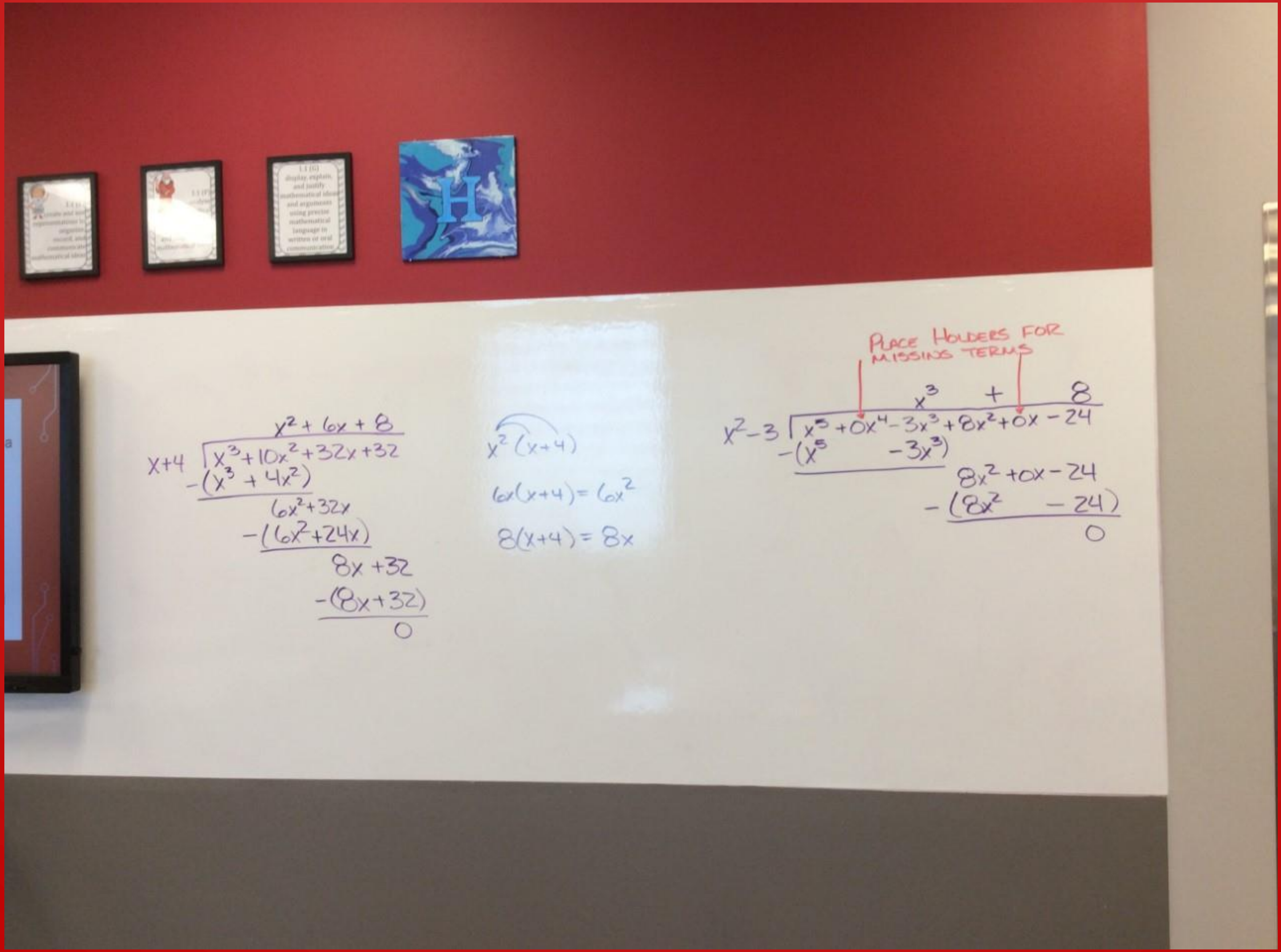
If $f(x)$ and $g(x)$ denote polynomial functions and if $g(x)$ is a polynomial whose degree is greater than zero, then there are unique polynomial functions $q(x)$ and $r(x)$ such that

$$\frac{f(x)}{g(x)} = q(x) + \frac{r(x)}{g(x)} \quad \text{or} \quad \underset{\substack{\uparrow \\ \textbf{dividend}}}{f(x)} = \underset{\substack{\uparrow \\ \textbf{quotient}}}{q(x)}\,\underset{\substack{\uparrow \\ \textbf{divisor}}}{g(x)} + \underset{\substack{\uparrow \\ \textbf{remainder}}}{r(x)}$$

Where $r(x)$ is either the zero polynomial or a polynomial of degree less than that of $g(x)$.


1.1 (A) apply mathematics to problems arising in everyday life, society, and the workplace
175 + 7/9
9 | 1582
- 9
68
-63
52
-45
7
QUOTIENT + REMAINDER
DIVISOR | DIVIDEND

BORGER INDEPENDENT SCHOOL DISTRICT 1926



$$
\begin{array}{r}
2x^3+2x^2+3x+3 \\
2x-3\,\overline{\big)\,4x^4-2x^3+0x^2-3x-9} \\
-(4x^4-6x^3) \\
\hline
4x^3+0x^2 \\
-(4x^3-6x^2) \\
\hline
6x^2-3x \\
-(6x^2-9x) \\
\hline
6x-9 \\
-(6x-9) \\
\hline
0
\end{array}
$$

SYNTH

DIVIS

DON

DI

SYNTHETIC DIVISION CAN ONLY BE DONE WITH A LINEAR DIVISOR! I.E. $x - c$ OR $x + c$

$f(x) = x^3 + 10x^2 + 32x + 32$

DIVISOR $x+4$

① $x + 4 = 0$

$x = -4$

② 1 10 32 32

③

+ ADD

-4	1	10	32	32
		-4	-24	-32
	1	6	8	0

X MULTIPLY BY

MY QUOTIENT IS $x^2 + 6x + 8$

$$f(x) = x^5 - 3x^3 + 8x^2 - 24$$
$$d(x) = x - 3$$

$$\begin{array}{r|rrrrrr} 3 & 1 & 0 & -3 & 8 & 0 & -24 \\ + & & 3 & 9 & 18 & 78 & 234 \\ \hline & 1 & 3 & 6 & 26 & 78 & 210 \end{array}$$

multiply by divisor

$$q(x) = x^4 + 3x^3 + 6x^2 + 26x + 78 + \frac{210}{x-3}$$