Class worksheet: Alg2H
Rational expressions: Divide (Long)
(book chapter 6)

Divide (two fractions)	
$$\dfrac{a}{b} \div \dfrac{c}{d} = \dfrac{a}{b} \cdot \dfrac{d}{c}$$	
$\dfrac{\frac{1}{8}}{\frac{1}{9}} = \dfrac{1}{8} \div \dfrac{1}{9} = \boxed{\dfrac{9}{8}}$	$\dfrac{x^2+7x+10}{2x-4} \div \dfrac{x^2-3x-10}{x-2} = \boxed{\begin{array}{c} x \neq 2 \\ \neq -5 \\ \neq -2 \end{array}}$ $= \dfrac{(x+2)(x+5)}{2(x-2)} \cdot \dfrac{(x-2)}{(x-5)(x+2)} =$ $= \boxed{\dfrac{x+5}{2(x-5)}}$

Division (simple)	
$\dfrac{a}{c} + \dfrac{b}{c} = \dfrac{a+b}{c} \implies \dfrac{a+b}{c} = \dfrac{a}{c} + \dfrac{b}{c}$	
$\dfrac{8x^2+4x+12}{4x} = \dfrac{8x^2}{4x} + \dfrac{4x}{4x} + \dfrac{12}{4x} = \boxed{2x+1+\dfrac{3}{x}}$	
$\dfrac{6x^3+2x^2-8x}{2x} = \boxed{3x^2+x+4}$	

$$(3x^3 + 19x^2 + 26x + 8) \div (3x + 4) = ?$$

$$(3x^3 + 19x^2 + 26x + 8) = (3x + 4) \cdot [x^2 + 5x + 2]$$

$$
\begin{array}{r}
5y^2 + 3y + 4 \\
2y + 3 \overline{\smash{)}10y^3 + 21y^2 + 17y + 12} \\
\underline{10y^3 + 15y^2} \\
6y^2 + 17y \\
\underline{6y^2 + 9y} \\
8y + 12
\end{array}
$$

$$\boxed{5y^2 + 3y + 4}$$

$$\frac{6y^3 - 8y^2 - 17y - 6}{3y + 2} = 2y^2 - 4y - 3$$

$$\frac{x^4 + x^3 + x^2 + 2x - 1}{(x - 1)} = \quad \hookrightarrow x^3 + x - 1$$

$$\frac{9y^4 + 14y^2 - 8}{3y + 2} = 3y^3 - 2y^2 + 6y - 4$$