2-4a Division of Polynomials

Objectives:

- I can divide one polynomial by another by using long division

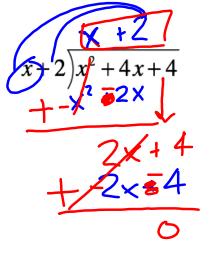Divide the following by using long division

a.

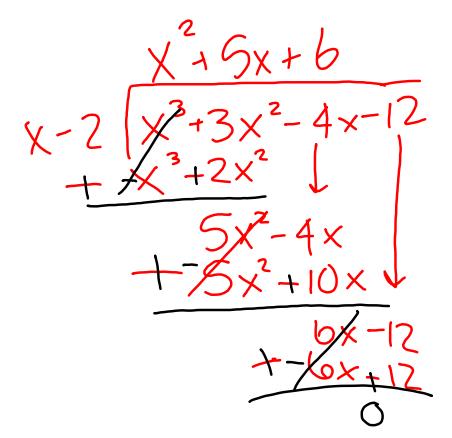$$
\begin{array}{r}
78 \\
3\overline{)234} \\
-21 \\
\hline
24 \\
-24 \\
\hline
0
\end{array}
$$

b.

$$
\begin{array}{r}
204 \\
41\overline{)8364} \\
82 \\
\hline
16 \\
0 \\
\hline
164 \\
-164 \\
\hline
0
\end{array}
$$

A polynomial can be divided by a divisor of the form x-r by using long division

a. Divide

$$x + 2 \overline{)\ x^2 + 4x + 4}$$

$x + 2$

$-x^2 - 2x$

$2x + 4$

$- 2x - 4$

0

b. Divide $(x^3 + 3x^2 - 4x - 12) \div (x - 2)$

$$
\begin{array}{r}
x^2 + 5x + 6 \\
x - 2 \overline{\smash{)} x^3 + 3x^2 - 4x - 12} \\
+\ -x^3 + 2x^2 \\
\hline
5x^2 - 4x \\
+\ -5x^2 + 10x \\
\hline
6x - 12 \\
+\ -6x + 12 \\
\hline
0
\end{array}
$$

(A) $(7x^3 - 6x^1 + 9) \div (x + 5)$

FiLL IN MiSSNg degrees WITH O's!

$$7x^2 - 35x + 169 + \dfrac{-836}{x+5}$$

$$1x+5 \overline{\smash{)}\, 7x^3 + 0x^2 - 6x + 9}$$

$+7x^3 \overline{-}35x^2$

$-35x^2 - 6x$

$+35x^2 + 175x$

$169x + 9$

$+169x \overline{-}845$

-836

$3 + \dfrac{1}{3}$

$$\left(x^3 + 4x^2 + x - 6\right) \div \left(x - 1\right)$$

$$
\begin{array}{r}
x^2 + 5x + 6 \\
x - 1 \overline{\smash{\big)}\ x^3 + 4x^2 + x - 6} \\
+ -x^3 + x^2 \\
\hline
5x^2 + x \\
+ -5x^2 + 5x \\
\hline
6x - 6 \\
+ -6x + 6 \\
\hline
0
\end{array}
$$

d. Divide $\left(x^4 - 3x + 2x^3 - 6\right) \div (x - 2)$

$$x - 2 \overline{\smash{\big)}\ x^4 + 2x^3 + 0x^2 - 3x - 6}$$

b. Divide $\left(x^2 + 2x + 5\right) \div \left(x - 2\right)$

c. Divide $\left(x^3 + 48\right) \div \left(x + 3\right)$