Name: Key NC Math 3 Unit: 2 Day: 2

Objective: Divide polynomials using long division.

Foundation:

Use long division to divide:

1) $25\overline{)425}$

$$\begin{array}{r} 17 \\ -25\downarrow \\ \hline 175 \\ -175 \\ \hline 0 \end{array}$$

2) $10\overline{)650}$

$$\begin{array}{r} 65 \\ -60\downarrow \\ \hline 50 \\ -50 \\ \hline 0 \end{array}$$

Notes:

Steps to Long Division:

1. Make sure the polynomial is in standard form.
2. Plug 0 place holders in for any missing terms.
3. Write the dividend under the division symbol and the divisor on the outside.
4. Compare the first two terms and write the number you need to multiply the outside first term by to equal the inside first term.
5. Write this number on top and multiply everything on the outside by the number on top.
6. Subtract.
7. Write your answer plus the remainder over what you divided by.

Examples:

Use Long division to divide the polynomials.

1. $(x^2-3x-40)\div(x+5)$

$$x+5\overline{)x^2-3x-40}$$

$x-8$

$-(x^2+5x)\downarrow$

$-8x-40$

$-(+8x+40)$

0

2. $(x^3+3x^2-x+2)\div(x-1)$

$$x-1\overline{)x^3+3x^2-x+2}$$

$x^2+4x+3+\frac{5}{x-1}$

$-(x^3+1x^2)\downarrow$

$4x^2-x$

$-(4x^2+4x)\downarrow$

$3x+2$

$-(3x+3)$

5

3. $(x^3-7x^2-7x+20)\div(x+4)$

$$x+4\overline{)x^3-7x^2-7x+20}$$

$x^2-11x+37-\frac{128}{x+4}$

$-(x^3+4x^2)\downarrow$

$-11x^2-7x$

$-(+11x^2+44x)\downarrow$

$37x+20$

$-(37x+148)$

-128

4. Challenge! Before you start... what is different about this problem?

$(3x^4+9x^2+8x+4)\div(x^2+2)$

$$x^2+0x+2\overline{)3x^4+0x^3+9x^2+8x+4}$$

$3x^2+3$

$-(3x^4+0x^3+6x^2)\downarrow$

$3x^2+8x+4$

$-(3x^2+0x+6)$

$8x-2$

$3x^2+3+\frac{8x-2}{x^2+2}$

Practice:

1) $(n^2 - 3n - 21) \div (n - 7)$

$n+4 + \frac{7}{n-7}$

2) $(2p^2 + 7p - 39) \div (2p - 7)$

$p+7+\frac{10}{2p-7}$

3) $(v^3 - 2v^2 - 14v - 5 \div (v + 3)$

$v^2-5v+1 - \frac{8}{v+3}$

4) $(-2x^2 + x^3 - 75) \div (x - 5)$

$x-5 \overline{)\ x^3-2x^2+0x-75}$

$x^2+3x+15$

$-(x^3+5x^2)\downarrow$

$3x^2+0x$

$-(3x^2+15x)\downarrow$

$15x-75$

$-(15x+75)$

0

5) $(5y^2 - 6y + 7) \div (5y - 1)$

$5y-1 \overline{)\ 5y^2-6y+7}$

$y-1+\frac{6}{5y-1}$

$-(5y^2+y)\downarrow$

$-5y+7$

$-(+5y+1)$

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6) $(3h^3 - 4h^2 + 2h + 4) \div (h^2 - 2h + 2)$

$h^2-2h+2 \overline{)\ 3h^3-4h^2+2h+4}$

$3h+2$

$-(3h^3+6h^2+6h)\downarrow$

$2h^2-4h+4$

$-(2h^2+4h+4)$

0

7) $(a^2 - 28) \div (a - 5)$

$a+5-\frac{3}{a-5}$

8) $(42x^2 - 33) \div (7x + 7)$

$6x-6+\frac{9}{7x+7}$