

HW ? 34, 42, 24 for 6.2

$$\textcircled{24} \quad (\underline{x^3} + \underline{x^2} + \underline{1}) (\underline{x^2} - \underline{x} - \underline{5})$$

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

$$x^5 - 6x^3 - 4x^2 - x - 5$$

$$\textcircled{34} (2x - 3y)^4$$

$$1 \quad 4 \quad 6 \quad 4 \quad 1$$

Pascal's

$\Delta \rightarrow$

1st \rightarrow

2nd \rightarrow

1	4	6	4	1
$(2x)^4$	$(2x)^3$	$(2x)^2$	$(2x)^1$	$(2x)^0$
$(-3y)^0$	$(-3y)^1$	$(-3y)^2$	$(-3y)^3$	$(-3y)^4$

$$16x^4 - 96x^3y + 216x^2y^2 - 216xy^3 + 81y^4$$

$$\textcircled{42} \quad (\underline{x^2} - \underline{2yz} - \underline{y^2})(y^2 + x)$$

$$x^2 y^2 + x^3 - 2y^3 z - 2xyz - y^4 - xy^2$$

6.3 Dividing Polynomials

CA.-3.0

Objective:

Use long division &
synthetic division to
divide polynomials

$$\begin{array}{r}
 124925 + \frac{6}{22} \\
 \hline
 22 \overline{) 2748356} \\
 \underline{-22} \downarrow \\
 54 \downarrow \\
 \underline{-44} \downarrow \\
 108 \downarrow \\
 \underline{88} \downarrow \\
 203 \downarrow \\
 \underline{198} \downarrow \\
 45 \downarrow \\
 \underline{45} \downarrow \\
 11 \downarrow \\
 \underline{11} \downarrow \\
 6 \downarrow \\
 \underline{6} \\
 0
 \end{array}$$

Ex 1

$$(4x^2 + 3x^3 + 10) \div (x - 2)$$

$$\begin{array}{r}
 3x^2 + 10x + 20 + \frac{50}{x-2} \\
 \hline
 (x-2) \overline{) 3x^3 + 4x^2 + 0x + 10} \\
 \underline{3x^3 - 6x^2} \quad \downarrow \\
 10x^2 + 0x \quad \downarrow \\
 \underline{- 10x^2 - 20x} \quad \downarrow \\
 20x + 10 \\
 \underline{- 20x - 40} \\
 50
 \end{array}$$

✓ it out 1a:

$$(15x^2 + 8x - 12) \div (3x + 1)$$

$$\begin{array}{r}
 5x + 1 - \frac{13}{3x+1} \\
 \hline
 \underline{3x+1} \overline{) 15x^2 + 8x - 12} \\
 \underline{-15x^2 + 5x} \\
 3x - 12 \\
 \underline{-3x + 1} \\
 -13
 \end{array}$$

✓ it out 1b

$$(x^2 + 5x - 28) \div (x - 3)$$

$$\begin{array}{r} x - 3 \overline{) x^2 + 5x - 28} \\ \underline{-(x^2 - 3x)} \\ 8x - 28 \end{array}$$

$$\begin{array}{r} 8x - 28 \\ \underline{- 8x + 24} \\ -4 \end{array}$$

$$x + 8 + \frac{-4}{(x-3)}$$

$$\underline{\text{Ex 2a}} \quad (4x^2 - 12x + 9) \div (x + \frac{1}{2})$$

$$\begin{array}{r}
 4 \quad -12 \quad 9 \\
 + \quad \quad -2 \quad 7 \\
 \hline
 x^{-\frac{1}{2}} \quad 4 \quad -14 \quad (16)
 \end{array}$$

$$4x - 14 + \frac{16}{(x + \frac{1}{2})}$$

$$\frac{\checkmark \text{ it out } 2a:}{(6x^2 - 5x - 6) \div (x+3)}$$

$$\begin{array}{r}
 6 \quad -5 \quad -6 \\
 + \quad -18 \quad 69 \\
 \hline
 x-3 \quad 6 \quad -23 \quad \underline{63} \\
 6x - 23 + \frac{63}{(x+3)}
 \end{array}$$

Ex 2b

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

$$\begin{array}{r}
 1 \quad -2 \quad 0 \quad 3 \quad 1 \\
 + \quad \quad 3 \quad 3 \quad 9 \quad 36 \\
 \hline
 x^3 \quad 1 \quad 1 \quad 3 \quad 12 \quad \underline{37} \\
 x^3 \quad x^2 \quad x^1 \quad x^0 = 1
 \end{array}$$

$$x^3 + x^2 + 3x + 12 + \frac{37}{(x-3)}$$

✓ it out 2b

$$(x^2 - 3x - 18) \div (x - 6)$$

$$\begin{array}{r}
 1 3 18 \\
 + 6 18 \\
 \hline
 x 6 1 3 0 \\
 | 3 0 \\
 x^1 x^0 R
 \end{array}$$

$$x + 3$$

Ex 3a $P(x) = x^3 - 4x^2 + 3x - 5$ for $x = 4$

$$\begin{array}{r}
 1 \quad -4 \quad 3 \quad -5 \\
 + \quad 4 \quad 0 \quad 12 \\
 \hline
 x4 \quad 1 \quad 0 \quad 3 \quad \textcircled{7} \quad P(4) = 7
 \end{array}$$

✓ it out 3a

$$P(x) = x^3 + 3x^2 + 4 \quad \text{for } x = -3$$

		1	3	0	4	
			-3	0	0	
	+					
x^{-3}		1	0	0	4	$P(-3) = 4$

Ex 3b

$$P(x) = 4x^4 + 2x^3 + 3x + 5 \quad \text{for } x = -\frac{1}{2}$$

	4	2	0	3	5
		-2	0	0	-1 $\frac{1}{2}$
x ^{-1/2} +					
x ^{-1/2}	4	0	0	3	(3 $\frac{1}{2}$)

$$P(-\frac{1}{2}) = 3\frac{1}{2}$$

✓ it out 3b

$$P(x) = 5x^2 + 9x + 3 \quad \text{for } x = \frac{1}{5}$$

$$\begin{array}{r} 5 \quad 9 \quad 3 \\ + \quad 1 \quad 2 \\ \hline x = \frac{1}{5} \quad 5 \quad 10 \quad \textcircled{5} \end{array}$$

$$P\left(\frac{1}{5}\right) = 5$$