

Polynomial Division Class Work

Objective: You will be able to divide polynomial expressions.

★ Synthetic Division:

Guided Example: $x^3 - 10x^2 + 20 \div (x - 5)$

*Always use the value that would cause the divisor to be zero.

list coefficients (Don't forget "0")

set divisor = 0
 $x - 5 = 0$
 $x = 5$

1	-10	0	20
5	-25	-125	
-5	-25	-105	

bring down first
 * multiply

Check: plug into original; it should = remainder!
 one less degree than original
 $x^2 - 5x - 25 - \frac{105}{x-5}$

$$\begin{aligned}
 &x^3 - 10x^2 + 20 \\
 &(5)^3 - 10(5)^2 + 20 \\
 &125 - 250 + 20 \\
 &-125 + 20 = -105 \checkmark
 \end{aligned}$$

Practice:

Divide each pair of polynomials using synthetic division. Check your answers using our new remainder theorem! ©

1. $3r^3 - 2r^2 - 22r + 3 \div (r - 3)$

divisor = 0
 $r - 3 = 0$
 $r = 3$

list coefficients


3	-2	-22	3
+9	+21	-3	
3	7	-1	0

bring down

Check:
 $3(3)^3 - 2(3)^2 - 22(3) + 3$
 $= 81 - 18 - 66 + 3$
 $= 63 - 66 + 3$
 $= -3 + 3$
 $= 0 \checkmark$

$r - 3$ is a factor
 $r = 3$ is one solution

$3r^2 + 7r - 1$

 Practice:

Divide each pair of polynomials using synthetic division.
Check your answers using our new remainder theorem! ☺

1. $3r^3 - 2r^2 - 22r + 3 \div (r - 3)$

* 2. $x^4 + 8x^3 + 4x^2 + 28 \div (x + 2)$
 $x^3 + 6x^2 - 8x + 16 - \frac{4}{x+2}$

* 3. $2w^7 - w^6 - w^3 + 2w^2 \div (w + 1)$
 $2w^6 - 3w^5 + 3w^4 - 3w^3 + 2w^2$

* 4. $8x^6 - 62x^5 - 16x^4 - 3x^3 + 24x^2 \div (x - 8)$
 $8x^5 + 2x^4 - 3x^2$

* 5. $20x^4 + 4x^3 - 15x^2 + 22x - 9 \div (2x - 1)$
 $20x^3 + 14x^2 - 8x + 18$

Create...