Dividing Polynomials Synthetic division:

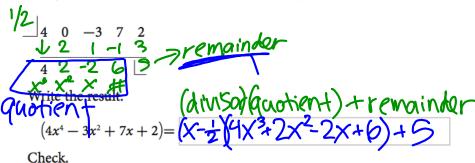
Can only be used to divide by a linear function steps:

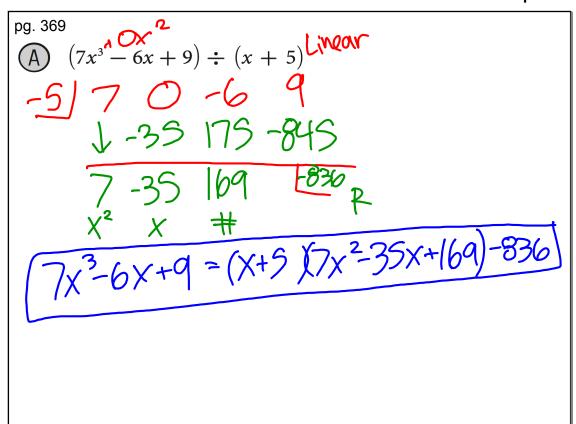
- 1. Write the terms of the dividend in descending order. Write the coeff. of the dividend in the first row using zeros for any missing terms not found in the dividend.
- 2. Write the zero, r, of the divisor (x-r),in the box.
- 3. Drop the 1st coeff. to the last row.
- 4. Multiply 1st coeff. by r & put product under the 2nd coeff.
- 5. Add product from #4 to 2nd coeff. & write the sum in the last row.
 - 6. Repeat #4 & #5 until all coeff. have been used.
 - 7. Write answer by putting variables behind the #'s in the last row. Start with 1 degree less than the dividend polynomial.

pg. 370 B $(4x^4 - 3x^2 + 7x + 2)$ $(4x^4 - 3x^2 + 7x + 2)$

Find a. Then write the coefficients and a in the synthetic division format.

Bring down the first coefficient. Then multiply and add for each column.





pg. 370

Your Turn

Given a polynomial p(x), use synthetic division to divide by x - a and obtain the quotient and the (nonzero) remainder. Write the result in the form p(x) = (x - a)(quotient) + p(a). You may wish to perform a check.

6.
$$(2x^3 + 5x^2 - x + 7) \div (x - 2)$$