Name_____

SYNTHETIC DIVISION WORKSHEET

- Don't forget ZERO Coefficients for missing degrees
- Solve the binomial divisor equal to zero.
- Multiply and Add Patterns
- If zero value is a fraction, then divide all coefficients by denominator.

1) **Perform the following divisions using Synthetic Division.**
Is the binomial divisor a factor of the polynomial? What is the quotient?

A. $(p^4 + 5p^3 - 11p^2 - 25p + 29) \div (p + 6)$

B. $(y^4 - 8y^3 + 10y^2 + 2y + 4) \div (y - 2)$

C. $(8v^5 + 32v^4 + 5v + 20) \div (v + 4)$

2) **Completely FACTOR each polynomial given a known factor.**
What are all of the factors of the polynomial?

A. $x^3 + 9x^2 + 23x + 15;\ \ x + 5$

B. $x^3 - x^2 - 14x + 25;\ \ x - 3$

3) **<u>For each polynomial, LIST all POSSIBLE RATIONAL ROOTS.</u>**
   - Find all factors of the leading coefficient and constant value of polynomial.
   - ANY RATIONAL ROOTS = ± (Constant Factor over Leading Coefficient Factor)

A. $x^5+7x^3-3x-12$ B. $x^4+2x^3-8x^2+16x-32$ C. x^3+27

D. $6x^3+7x^2-3x-1$ E. $3x^2+2x+2$ F. $4x^2-9$

4) **<u>Completely FACTOR and find all zeros for each polynomial:</u>**
   - List all POSSIBLE RATIONAL ZEROS (Section #3)
   - Use Synthetic Division to check each zero. (Section #2)
   - When you reach a quadratic equation, perform regular factoring or Quadratic Formula.

A. x^3+4x^2+5x+2

B. $5x^3+29x^2+19x-5$

C. $3x^4-10x^3-24x^2-6x+5$