 Name: _____

5.1.D6 ~ More Zeros of Polynomial Functions

Past due on: _____ Period: _____

Analyze each polynomial function for its long-run and short-run behavior. Use the appropriate method: factoring (if necessary) and the Zero Product Property, the Square Root Property, or the Quadratic Formula, to find the x-intercepts/zeros of the polynomial function. *If necessary, round to 2 decimal places.*

1. $f(x) = -x^2(25x^2 + 15x + 2)$

   DEGREE: _____ $\lim_{x\to-\infty} f(x) =$ _____

   LEADING COEFFICIENT: _____

   CONSTANT: _____ $\lim_{x\to\infty} f(x) =$ _____

   ROOTS/ZEROS:

2. $f(x) = (7x^2 - 2)(x^2 - 2)$

   DEGREE: _____ $\lim_{x\to-\infty} f(x) =$ _____

   LEADING COEFFICIENT: _____

   CONSTANT: _____ $\lim_{x\to\infty} f(x) =$ _____

   ROOTS/ZEROS:

3. $f(x) = -x(x^2 - 2x - 5)$

   DEGREE: _____ $\lim_{x\to-\infty} f(x) =$ _____

   LEADING COEFFICIENT: _____

   CONSTANT: _____ $\lim_{x\to\infty} f(x) =$ _____

   ROOTS/ZEROS:

4. $f(x) = (2x + 3)(4x^2 - 5)$

   DEGREE: _____ $\lim_{x\to-\infty} f(x) =$ _____

   LEADING COEFFICIENT: _____

   CONSTANT: _____ $\lim_{x\to\infty} f(x) =$ _____

   ROOTS/ZEROS:

Use synthetic division to determine the quotient and remainder.

5. $(x^5 - x^4 - 46x^3 + 28x^2 + 10) \div (x - 7)$

6. $(6x^4 + 24x^3 + 2x + 7) \div (x + 4)$

Use the given zero, synthetic division, and then factoring to write the equation of the polynomial function in factored form. Then find its zeros.

7. $f(x) = 2x^3 + 5x^2 - 6x - 9;\ -3$ is a zero

Synthetic division:

Factoring:

ROOTS/ZEROS: $-3,$

Complete factorization: $(x + 3)$

8. $f(x) = 5x^3 + 29x^2 + 19x - 5;\ -5$ is a zero

Synthetic division:

Factoring:

ROOTS/ZEROS: -5

Complete factorization: $(x + 5)$

9. $f(x) = 2x^3 - 6x^2 - 23x + 15;\ 5$ is a zero

Synthetic division:

Use the Quadratic Formula to find the remaining zeros; round to 2 decimal places.

ROOTS/ZEROS: 5

10. $f(x) = 3x^3 - 4x^2 - 31x - 22;\ -2$ is a zero

Synthetic division:

Use the Quadratic Formula to find the remaining zeros; round to 2 decimal places.

ROOTS/ZEROS: -2