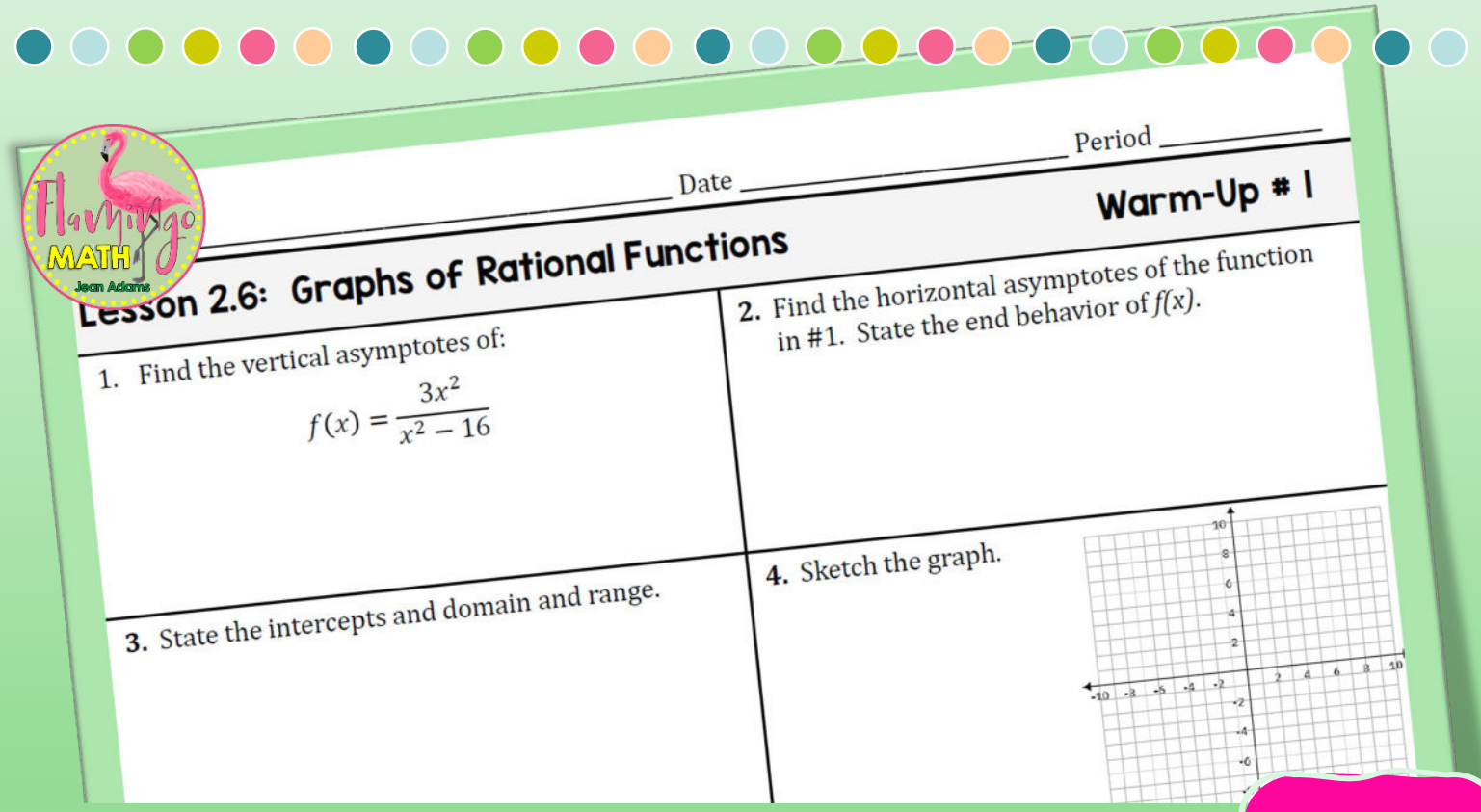
Precalculus Honors

Polynomial Power & Rational Functions



Warm-Ups 2

Completely Editable

PRECALCULUS CURRICULUM

Scope and Sequence

Unit 2: Polynomials, Power & Rational Functions

Lesson	Skills & Learning Objectives
[2.1] Linear & Quadratic Functions	▪ Recognize and graph linear and quadratic functions ▪ Describe qualities and characteristics of linear and quadratic functions ▪ Graph linear and quadratic functions by recognition of equations ▪ Choose, write and analyze an algebraic model given real-world scenarios
[2.2] Power Functions	▪ Graph and use power functions to solve real-world problems ▪ Describe the basic characteristics of power functions, including power and constant of variation ▪ Determine relative rates of growth, concavity, and more for power functions
[2.3] Polynomial Functions and Their Graphs	▪ Graph and use the leading term test to sketch the general shape of a polynomial ▪ Describe the basic characteristics of a polynomial from the equation (increase, decrease, constant, concavity, inflection points) ▪ Find zeros, multiplicity of zeros, extrema, and end behavior ▪ Use the Intermediate Value Theorem to find zeros ▪ Estimate points of inflection
[2.4] Real Zeros of Polynomial Functions	▪ Apply the Remainder Theorem, Factor Theorem, and Rational Zeros Theorem ▪ Use the Remainder and Factor Theorems ▪ Divide polynomials using long division and synthetic division. ▪ Find both real zeros and rational zeros of polynomials. ▪ Explain the connections of characteristics such as roots, zeros, factors, and x-intercepts

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Scope and Sequence

Unit 2: Polynomials, Power & Rational Functions

Lesson	Skills & Learning Objectives
[2.5] Complex Zeros & the Fundamental Theorem of Algebra	▪ Use the Fundamental Theorem of Algebra to factor polynomials ▪ Write polynomials in standard form given zeros, degree, multiplicity, and factors ▪ Find all zeros both real and complex using the Fundamental Theorem of Algebra ▪ Write a linear factorization of polynomials given equations, zeros, and other key characteristics.
[2.6] Graphs of Rational Functions	▪ Graph transformations of the reciprocal function, by finding vertical and horizontal asymptotes and intercepts. ▪ Factor and simplify rational expressions ▪ Find removable and non-removable points of discontinuity ▪ Analyze rational functions completely, including using limit notation to describe behavior at both horizontal and vertical asymptotes
[2.7] Analyzing Rational Functions	▪ Analyze rational functions completely, including using limit notation to describe behavior at both horizontal and vertical asymptotes ▪ Use test intervals to establish function behavior for analysis ▪ Solve applied problems for rational functions
[2.8] Solving Rational Equations & Inequalities	▪ Solve equations involving fractions using both algebraic and graphical techniques ▪ Find where rational functions are zero and the intervals where the polynomial is positive or negative by using a sign chart. ▪ Solve polynomial and rational inequalities, identify extraneous solutions ▪ Model and predict real-world scenarios with given parameter values

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Name _____ Date _____ Period _____

Lesson 2.3: Polynomials of Higher Degree — Warm-Up # 1

1. Describe the left- and right-hand behavior of

$$f(x) = -3x^4 - 6x^2 + 3x + 7$$

2. At most, how many turning points does a 6^{th} degree polynomial have?

3. Find all zeros and state the multiplicity of the zeros.

$$y = x^3 - 6x^2 + 9x$$

4. Find a polynomial that has the given zeros.
$\{-2, -1, 0\}$

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Lesson 2.3: Polynomials of Higher Degree — Warm-Up # 2

1. Describe the left- and right-hand behavior of

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

2. At most, how many turning points does a 3^{rd} degree polynomial have?

3. Find all zeros and state the multiplicity of the zeros.

$$y = x^4 + 10x^3 + 25x^2$$

4. Find a polynomial that has the given zeros.
$\{-4, 0, 4\}$

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Lesson 2.4: Real Zeros of Polynomial Functions — Warm-Up # 1

1. List all the possible rational zeros of:
$$f(x) = 3x^3 + 2x^2 + 9x + 9$$

2. Find $f(-3)$ using the Remainder Theorem for
$$f(x) = 3x^3 + 4x^2 + 8$$

3. Divide $(2x^4 + 3x^3 + x - 7)$ by $(x - 2)$. Write answer as $q(x) + \frac{f(x)}{d(x)}$.

4. Write a polynomial with a leading coefficient of 4 that has zeros at x = -1, 0, 1

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Lesson 2.4: Real Zeros of Polynomial Functions — Warm-Up # 2

1. List all the possible rational zeros of:
$$f(x) = 2x^3 + 3x^2 + 5x + 8$$

2. Find $f(2)$ using the Remainder Theorem for
$$f(x) = 5x^3 - 2x^2 + 3$$

3. Divide $(3x^4 + 2x^3 - x + 2)$ by $(x + 1)$. Write answer as $q(x) + \frac{f(x)}{d(x)}$.

4. Write a polynomial with a leading coefficient of 2 that has zeros at x = -3, 0, 2

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Lesson 2.6: Graphs of Rational Functions — Warm-Up # 1

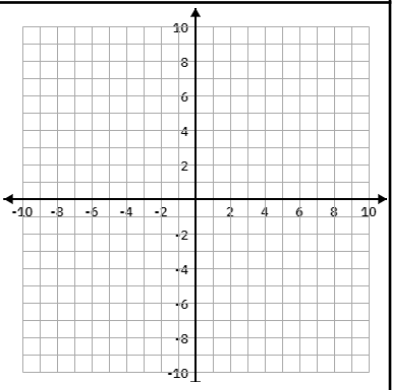
1. Find the vertical asymptotes of:

$$f(x) = \frac{3x^2}{x^2 - 16}$$

2. Find the horizontal asymptotes of the function in #1. State the end behavior of *f(x)*.

3. State the intercepts and domain and range.

4. Sketch the graph.



Name _____ Date _____ Period _____

Lesson 2.6: Graphs of Rational Functions — Warm-Up # 2

1. Find the vertical asymptotes of:

$$f(x) = \frac{-3x^2}{x^2 - 1}$$

2. Find the horizontal asymptotes of the function in #1. State the end behavior of *f(x)*.

3. State the intercepts and domain and range.

4. Sketch the graph.

