Name:_____   Date: _____

Name	Numerically	Graphically	Domain & Range	Continuity
constant			domain:	continuous / discontinuous (circle one)
Algebraically			range:	**Increasing/Decreasing**
$y = c$ For example: $y = 2$			one to one?	increasing: decreasing:

x	f(x)
–2	

Verbally: The function whose output is

Intercepts	End Behavior	Asymptotes	Extrema
y–intercept:	As $x \to -\infty, f(x) \to$ _____	vertical:	absolute maximum value: _____ at _____
zeros:	As $x \to \infty, f(x) \to$ _____	horizontal:	absolute minimum value: _____ at _____

Name	Numerically	Graphically	Domain & Range	Continuity
identity			domain:	continuous / discontinuous (circle one)
Algebraically			range:	**Increasing/Decreasing**
$y = x$			one to one?	increasing: decreasing:

x	f(x)
–2	

Verbally: The function whose output is

Intercepts	End Behavior	Asymptotes	Extrema
y–intercept:	As $x \to -\infty, f(x) \to$ _____	vertical:	absolute maximum value: _____ at _____
zeros:	As $x \to \infty, f(x) \to$ _____	horizontal:	absolute minimum value: _____ at _____

Name	Numerically		Graphically	Domain & Range	Continuity
Absolute Value	x	$f(x)$		domain:	continuous / discontinuous (circle one)
	–2				
Algebraically				range:	**Increasing/Decreasing**
$y = \lvert x \rvert$				one to one?	increasing: decreasing:

Verbally: The function whose output is

Intercepts	End Behavior	Asymptotes	Extrema
y–intercept: zeros:	As $x \to -\infty$, $f(x) \to$ _____ As $x \to \infty$, $f(x) \to$ _____	vertical: horizontal:	absolute maximum value: _____ at _____ absolute minimum value: _____ at _____

Name	Numerically		Graphically	Domain & Range	Continuity
Quadratic	x	$f(x)$		domain:	continuous / discontinuous (circle one)
	–3				
	–2				
Algebraically	–1			range:	**Increasing/Decreasing**
	0				
	1			one to one?	increasing:
$y = x^2$	2				decreasing:
	3				

Verbally: The function whose output is

Intercepts	End Behavior	Asymptotes	Extrema
y–intercept: zeros:	As $x \to -\infty$, $f(x) \to$ _____ As $x \to \infty$, $f(x) \to$ _____	vertical: horizontal:	absolute maximum value: _____ at _____ absolute minimum value: _____ at _____

Name	Numerically	Graphically	Domain & Range	Continuity
Square Root			domain:	continuous / discontinuous (circle one)

	x	$f(x)$
	–4	
	–1	
Algebraically	0	
	1	
$y = \sqrt{x}$		

range:

one to one?

Increasing/Decreasing

increasing:

decreasing:

Verbally: The function whose output is

Intercepts	End Behavior	Asymptotes	Extrema
y–intercept:	As $x \to 0, f(x) \to$ _____	vertical:	absolute maximum value: _____ at _____
zeros:	As $x \to \infty, f(x) \to$ _____	horizontal:	absolute minimum value: _____ at _____

Name	Numerically	Graphically	Domain & Range	Continuity
Cubic			domain:	continuous / discontinuous (circle one)

	x	$f(x)$
	–2	
	–1	
Algebraically	0	
	1	
	2	
$y = x^3$		

range:

one to one?

Increasing/Decreasing

increasing:

decreasing:

Verbally: The function whose output is

Intercepts	End Behavior	Asymptotes	Extrema
y–intercept:	As $x \to -\infty, f(x) \to$ _____	vertical:	absolute maximum value: _____ at _____
zeros:	As $x \to \infty, f(x) \to$ _____	horizontal:	absolute minimum value: _____ at _____

Name	Numerically		Graphically	Domain & Range	Continuity
Cube Root	x	$f(x)$		domain:	continuous / discontinuous (circle one)
	-1				
Algebraically	0			range:	**Increasing/Decreasing**
	1				
$y = \sqrt[3]{x}$				one to one?	increasing: decreasing:

Verbally: The function whose output is

Intercepts	End Behavior	Asymptotes	Extrema
y–intercept: zeros:	As $x \to 0$, $f(x) \to$ _____ As $x \to \infty$, $f(x) \to$ _____	vertical: horizontal:	absolute maximum value: _____ at _____ absolute minimum value: _____ at _____

Name	Numerically		Graphically	Domain & Range	Continuity
Rational or Reciprocal	x	$f(x)$		domain:	continuous / discontinuous (circle one)
	-2				
	-1				
Algebraically	$-\tfrac{1}{2}$			range:	**Increasing/Decreasing**
	0				
$y = \dfrac{1}{x}$	$\tfrac{1}{2}$			one to one?	increasing: decreasing:
	1				
	2				

Verbally: The function whose output is

Intercepts	End Behavior	Asymptotes	Extrema
y–intercept: zeros:	As $x \to -\infty$, $f(x) \to$ _____ As $x \to \infty$, $f(x) \to$ _____	vertical: horizontal:	absolute maximum value: _____ at _____ absolute minimum value: _____ at _____

Name	Numerically	Graphically	Domain & Range	Continuity
Exponential			domain:	continuous / discontinuous (circle one)
Algebraically			range:	**Increasing/Decreasing**
$y = e^x$			one to one?	increasing: decreasing:

Verbally: The function whose output is

Intercepts	End Behavior	Asymptotes	Extrema
y–intercept:	As $x \to 0$, $f(x) \to$ _____	vertical:	absolute maximum value: _____ at _____
zeros:	As $x \to \infty$, $f(x) \to$ _____	horizontal:	absolute minimum value: _____ at _____

Name	Numerically	Graphically	Domain & Range	Continuity
Logarithmic			domain:	continuous / discontinuous (circle one)
Algebraically			range:	**Increasing/Decreasing**
$y = \ln x$			one to one?	increasing: decreasing:

Verbally: The function whose output is

Intercepts	End Behavior	Asymptotes	Extrema
y–intercept:	As $x \to -\infty$, $f(x) \to$ _____	vertical:	absolute maximum value: _____ at _____
zeros:	As $x \to \infty$, $f(x) \to$ _____	horizontal:	absolute minimum value: _____ at _____

Name	Numerically	Graphically	Domain & Range	Intercepts
an important relation	x | $f(x)$	y ... x	domain:	y–intercept: zeros:
Algebraically			range:	
$x = y^2$			one to one?	

Factor completely, if possible, using proper notation.

1. $9y^4 - 25x^2$

2. $x^4 - 81$

3. $4x - 100x^3$

4. $3x^2 + 12x + 12$

5. $28x^4 + 63x^2$

6. $2x^3 - 20x^2 - 48x$

7. $5x^2 - 13x - 6$

8. $9x^2 + 30x - 24$

9. $x^3 + 216$

10. $64 - 125x^3$

11. $2x^3 - 3x^2 + 32x - 48$

12. $4x^3 + x^2 - 100x - 25$

13. $x^4 - 5x^2 + 4$

14. $x^2 - 13x - 48$

15. $9x^2 - 12xy + 4y^2$