

SBA Prep #1: Algebra 2

Functions

HW #3: #7-13

Algebra 2 – SBA Prep #1
In Class Notes

Name _____
Pd _____ Date _____

1. Choose the domain for which each function is defined.

	All real numbers	$x \neq 3$	$x \leq 3$	$x \geq 3$
$f(x) = \frac{x}{x-3}$		✓		
$f(x) = \sqrt[3]{x-3}$	✓			
$f(x) = \frac{\sqrt{x-3}}{x^2}$				✓
$f(x) = \sqrt{3-x}$			✓	

$x-3 \neq 0 \quad x \neq 3$

$x^2 \neq 0 \quad x \neq 0$

$x-3 \geq 0 \quad x \geq 3$

$3-x \geq 0$
 $-3 \quad -3$
 $+x \geq +3$
 $+1 \quad +1$
 $x \leq 3$

2. Determine to which family each function below belongs by placing an X in each row of the table below.

Function	Linear	Quadratic	Polynomial	Rational	Exponential
$f(x) = x(x-1)^2 + 1$ no exp x^3			X		
$f(x) = 3x - (2x+1) - (5-x)$	X				
$f(x) = 3 \cdot 2^x$					X
$f(x) = 2x + x(x+1)$ x^2		X			
$f(x) = 2x + \frac{1}{x-1}$				X	
$f(x) = \frac{x(x-1)^2}{3}$ x^3			X		

3. Write an expression equivalent to $(2x^2 + 1) - (x^2 - 3x + 1) + (2x - 3)$ using the fewest number of possible terms.

$2x^2 + 1 - x^2 + 3x - 1 + 2x - 3$

$x^2 + 5x - 3$

4. Determine whether each expression is equivalent to $(x+1)^2 - (x+1)(x-3)$. Select Yes or No for each expression.

	Yes	No
$2x+4$		✓
$4(x+1)$	✓	
$(x+1)[(x+1)-(x-3)]$	✓	
-2		✓
$-2(x+1)$		✓

$(x+1)(x+1) - (x+1)(x-3)$
 $x^2+x+x+1 - x^2-3x+x-3$
 $(x^2+2x+1) - (x^2-2x-3)$
 $x^2+2x+1 - x^2+2x+3$
 $4x+4$

5. Determine whether each expression is equivalent to $8x^3 + 64$. Select Yes or No for each expression.

	Yes	No
$(2x+4)^3$		✓
$8(x+2)^3$		✓
$8(x^3+8)$	✓	
$8(x^3+2^3)$	✓	
$(8x+16)(x^2-2x+4)$	✓	
$8(x+2)(x^2-2x+4)$	✓	

$8(x+2)(x+2)(x+2)$
 $8(x^2+4x+4)(x+2)$
 $(8x^2+32x+32)(x+2)$
 (not same as $8x^3+64$)

$8(x^3+8)$
 $8x^3+64$ ✓

$(2x+4)(2x+4)(2x+4)$
 $(4x^2+8x+16)(2x+4)$
 $(4x^2+16x+16)(2x+4)$
 (not same as $8x^3+64$)
 $8(x^3+2^3)$
 $8(x^3+8)$
 $8x^3+64$ ✓

Solving:

6. Select whether each equation has no real solution, one real solution, or infinitely many real solutions.

	No Real Solution	One Real Solution	Infinitely Many Real Solutions
$\frac{2}{x} = \frac{2}{x+1}$	✗		
$\frac{4}{2x-6} = \frac{2}{x-3}$			✗
$\sqrt{2x-1} - 4 = 0$			

$\frac{2}{x} = \frac{2}{x+1}$
 $2x = 2x+2$
 $-2x - 2x$
 $0 = 2$
 False, so
 No Solution

$\frac{4}{2x-6} = \frac{2}{x-3}$
 $4x-12 = 4x-12$
 $-4x - 4x$
 $-12 = -12$
 $+12 +12$
 $0 = 0$
 true, so
 Infinitely Many Solutions

$\sqrt{2x-1} - 4 = 0$
 $+4 +4$
 $(\sqrt{2x-1})^2 = (4)^2$
 $2x-1 = 16$
 $+1 +1$
 $\frac{2x}{2} = \frac{17}{2}$
 $x = 8.5$
 One real solution