

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

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

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
$f(x) = x(x-1)^2 + 1$					
$f(x) = 3x - (2x+1) - (5-x)$					
$f(x) = 3 \cdot 2^x$					
$f(x) = 2x + x(x+1)$					
$f(x) = 2x + \frac{1}{x-1}$					
$f(x) = \frac{x(x-1)^2}{3}$					

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

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

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

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

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

**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
$\frac{2}{x} = \frac{2}{x+1}$			
$\frac{4}{2x-6} = \frac{2}{x-3}$			
$\sqrt{2x-1} - 4 = 0$			

**Algebra 2 – SBA Prep #1**  
**Homework #3**

Name \_\_\_\_\_  
 Pd \_\_\_\_\_ Date \_\_\_\_\_

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

	All real numbers	$x \neq 0$	$x \neq 4$	$x \neq -4$
$f(x) = \frac{x+4}{x}$				
$f(x) = \frac{x}{x+4}$				
$f(x) = x(x+4)$				
$f(x) = \frac{4}{x^2 + 8x + 16}$				

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

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

	Yes	No
$8(8x^3 - 1)$		
$8(2x - 1)^3$		
$8[(2x)^3 - 1]$		
$8(2x - 1)(4x^2 + 2x + 1)$		
$(16x - 8)(4x^2 + 2x + 1)$		
$(4x - 2)^3$		

10. Select whether each equation has no real solution, one real solution, or two real solutions.

	No Real Solution	One Real Solution	Two Real Solutions
$\frac{2}{x} = \frac{3}{x+1}$			
$\sqrt{x^2 - 8} = 3$			
$\frac{1}{x+1} = \frac{x}{x+2}$			

11. Determine if each equation is true for all values of  $x$ .

	Yes	No
$(x + 2)^2 = x^2 + 4$		
$(2x - 10)^2 = 4(x - 5)^2$		
$(x + 2)^2 = (x + 2)(x + 2)$		
$(x + 2)(x - 2) = x^2 - 4x - 4$		
$2^{4x} = 8^x$		
$e^x \cdot e^x = 2e^x$		
$3 \cdot 2^x = 6^x$		
$3 \cdot 2^x = 2^{3x}$		
$4^x = 2^{2x}$		

12. Select Yes or No to indicate whether each value of  $x$  is a solution to the equation  $\frac{2}{3} = \frac{3}{x-1}$ .

Solution	Yes	No
$x = 4$		
$x = 5$		
$x = \frac{11}{2}$		
$x = \frac{2}{11}$		

13. A student solved  $\sqrt{x+5} + 3 = 0$  in four steps as shown.

Step 1:  $\sqrt{x+5} = -3$

Step 2:  $(\sqrt{x+5})^2 = (-3)^2$

Step 3:  $x + 5 = 9$

Step 4:  $x = 4$

Which statement is an accurate interpretation of the student's work?

- The correct solution is  $x = 4$ .
- The student made an error in Step 1.
- The student made an error in Step 3.
- $x = 4$  is a solution to the equation in Step 2, but not to the original equation.