

Name: Key

## Unit 7 In Class Review

1. Determine if the functions are even/odd/neither. Explain how you know. You may use algebra or graphs.

a.  $f(x) = \frac{2x-1}{3} = \frac{2}{3}x - \frac{1}{3}$   
 $\begin{matrix} \uparrow & \uparrow \\ \text{odd} & \text{even} \\ \text{neither} \end{matrix}$

b.  $f(x) = 4x^7 + 8x^3$   
 $\begin{matrix} \uparrow & \uparrow \\ \text{odd} & \text{odd} \\ \text{odd} \end{matrix}$

c.  $f(x) = 4|x| - 9$   
 $\begin{matrix} \uparrow & \uparrow \\ \text{even} & \text{even} \\ \text{even} \end{matrix}$

2. The number of minutes needed to solve an exercise set of math problems varies directly as the number of problems and inversely as the number of people working on the solutions. It takes 4 people 36 minutes to solve 18 problems. How many minutes will it take 6 people to solve 42 problems.

$m = \text{minutes}$   
 $n = \text{number of problems}$   
 $P = \text{People}$

$m = \frac{Kn}{P}$   
 $36 = \frac{K(18)}{4}$   
 $K = \frac{4 \cdot 36}{18} = 8$

$m = \frac{8n}{P}$   
 $m = \frac{8 \cdot 42}{6} = 56 \text{ minutes}$

3. A drama club is planning a bus trip to New York City to see a Broadway play. The cost per person for the bus rental varies inversely as the number of people going on the trip. It will cost \$38 per person if 30 people go on the trip. How much will it cost per person if 66 people go on the trip? Round your answer to the nearest cent, if necessary.

$c = \text{cost per person}$   
 $n = \text{number of people}$

$c = \frac{K}{n}$   
 $38 = \frac{K}{30}$   
 $K = 1140$

$c = \frac{1140}{n}$   
 $c = \frac{1140}{66}$   
 $c = \$17.27$

4. Find the excluded values of the rational functions.

a.  $y = \frac{2}{4x+36}$   
 $4x+36=0$   
 $4x=-36$   
 $x = -9$

b.  $y = \frac{4x+3}{10x-30}$   
 $10x-30=0$   
 $10x=30$   
 $x=3$

Solve the rational equations below. Identify the excluded values and the LCD.

(See separate sheet)

5.  $\frac{3x}{x^2+2x-8} = \frac{1}{x-2} + \frac{x}{x+4}$   
 $(x+4)(x-2)$   
 No Solution

6.  $\frac{2}{x} + \frac{5}{2x} = -3$   
 $x = -\frac{3}{2}$

7.  $\frac{2m}{m-1} + \frac{m-5}{m^2-1} = 1$   
 $(m-1)(m+1)$   
 $m = 4$

8.  $\frac{2x-5}{x-2} - 2 = \frac{3}{x+2}$   
 $x = 1$

9. While solving a rational equation, what happens when your answer is the same number as an excluded value? The solution is extraneous

Find the inverses of the following functions.

10.  $f(x) = \frac{2x-1}{3}$   
 $y = \frac{2x-1}{3}$   
 $x = \frac{2y-1}{3}$   
 $3x = 2y-1$   
 $3x+1 = 2y$   
 $y = \frac{1}{2}(3x+1) = \frac{3x+1}{2} = \frac{3}{2}x + \frac{1}{2}$

11.  $f(x) = (\sqrt{x-7})^4$   
 $y = (\sqrt{x-7})^4$   
 $x = (\sqrt{y-7})^4$   
 $x = ((y-7)^{1/2})^4$   
 $x = (y-7)^2$   
 $x^{1/2} = y-7$   
 $\sqrt{y} = x^{1/2} + 7 = \sqrt{x} + 7$

12.  $f(x) = \frac{1}{2}x + 2$   
 $y = \frac{1}{2}x + 2$   
 $x-2 = \frac{1}{2}y$   
 $y = 2(x-2) = 2x-4$

$$\textcircled{5} \quad \frac{3x}{(x+4)(x-2)} = \frac{1}{x-2} + \frac{x}{x+4}$$

LCD:  $(x+4)(x-2)$  EV:  $x=2, -4$

$$3x = x+4 + x(x-2)$$

$$3x = x+4 + x^2 - 2x$$

$$3x = x^2 - x + 4$$

$$0 = x^2 - 4x + 4$$

$$0 = (x-2)^2$$

~~$x=2$~~  ← EV  
extraneous

No Solution

$$\textcircled{6} \quad \frac{2}{x} + \frac{5}{2x} = -3$$

LCD:  $2x$  EV:  $x=0$

$$4 + 5 = -6x$$

$$9 = -6x$$

$$x = \frac{9}{-6} = -\frac{3}{2}$$

$$\textcircled{7} \quad \frac{2m}{m-1} + \frac{m-5}{(m-1)(m+1)} = 1$$

LCD:  $(m-1)(m+1)$  EV:  $m=1, -1$

$$2m(m+1) + m-5 = (m-1)(m+1)$$

$$2m^2 + 2m + m - 5 = m^2 - 1$$

$$2m^2 + 3m - 5 = m^2 - 1$$

$$m^2 + 3m - 4 = 0$$

$$(m+4)(m-1) = 0$$

$m=4$  ← EV →  
extraneous solution

$$\textcircled{8} \quad \frac{2x-5}{x-2} - 2 = \frac{3}{x+2}$$

LCD:  $(x-2)(x+2)$  EV:  $x=2, -2$

$$(2x-5)(x+2) - 2(x-2)(x+2) = 3(x-2)$$

$$2x^2 - x - 10 - 2(x^2 - 4) = 3x - 6$$

$$2x^2 - x - 10 - 2x^2 + 8 = 3x - 6$$

$$-x - 2 = 3x - 6$$

$$-2 = 4x - 6$$

$$4x = 4$$

$$x = 1$$