Name:_____ Date:_____

HW Pre-Calculus 11 Section 4.1 Rational Expressions and NPV

1. Given each algebraic expression, indicate which ones are rational expressions. Explain why or why not:

a) $y=\frac{x+2}{x-3}$	b) $y=\frac{12}{x}$	c) $y=\frac{\sqrt{x}}{x}$
d) $y=\frac{2^x+\sqrt{7}}{x^3+10x}$	e) $y=x^{-3}+12x^{-2}$	f) $y=\frac{\sqrt{8}x^3+2x^2+3}{x^2-3}$
g) $y=\frac{\sqrt{x^3}+2x^2+3}{x^2-3}$	h) $y=16x$	i) $y=12$

2. Given each rational expression, find the non-permissible values

a) $\frac{2x}{(x-1)(x+4)}$	b) $\frac{x-1}{x(x-1)(2x+5)}$	c) $\frac{2x}{(x-3)(2x+7)}$
d) $\frac{5x}{(2x-3)+(3x-7)}$	e) $\frac{2x}{2x(4x+3)-3(4x+3)}$	f) $\frac{6x}{x^2-2x-24}$
g) $\frac{5-2x}{3x^2-11x+6}$	h) $\frac{2x^2-3x}{12x^2-53x+56}$	i) $\frac{8-2x}{2x^3+5x^2-12x}$

j) $\frac{3}{(x^2-16)(x^2+1)}$	k) $\frac{5}{x(x^3-8)(x^2+2)}$	L) $\frac{2}{x^3+3x^2+3x+1}$

3. Simplify each of the following rational expressions and indicate the NPV. Show all your work on how you factored each expression

a) $\frac{2x}{x(2x+3)}$ NPV:	b) $\frac{8x+2x^2}{x(4+x)}$ NPV:	c) $\frac{6x-3}{x-2x^2}$ NPV:
d) $\frac{3x-18}{x^2-4x-12}$ NPV:	e) $\frac{2x-8}{x^2-16}$ NPV:	f) $\frac{x^2+x-6}{x^2+5x+6}$ NPV:
g) $\frac{x^2+x-20}{x^2+8x+15}$ NPV:	h) $\frac{4x^2-9}{8x^2+18x+9}$ NPV:	i) $\frac{12x^2-25x+12}{18x^2-39x+20}$ NPV:

g) $\frac{3x^2-7xy+2y^2}{2x^2+7xy+3y^2}$ NPV:	h) $\frac{a^2+7ab+12b^2}{a^2-16b^2}$ NPV:	i) $\frac{15a^2+16ab-7b^2}{15a^2-26ab+7b^2}$ NPV:

4. What is a non-permissible value? Define it using your own words

5. A student tries to simplify the expressions with the following steps. Find all the errors and correct it:

$step1 := \frac{3x}{3x+2}$ $step2 := \frac{\cancel{3x}}{\cancel{3x}+2}$ $step3 := \frac{1}{2}$	$step1 : = \frac{x-6}{6-x}$ $step2 : = \frac{x-\cancel{6}}{\cancel{6}-x}$ $step3 : = \frac{x}{-x}$ $step4 : = \frac{\cancel{x}}{-\cancel{x}}$ $step5 : = -1$	$step1 := \frac{6x^2-3x}{3x}$ $step2 := \frac{\cancel{3x}(2x-1)}{\cancel{3x}}$ $step3 := 2x-1$

6. Given the expression $\frac{15ab^3}{ab(7c+3)}$, list out all the NPV's:

7. A rectangular board 12m by 16m has an area of 192cm^2. If you plan to reduce the width of the board and maintain the same area, the equation for the length will be: $L = \frac{192}{12 - x}$, where "x" is how much you reduce the width by. What is the NPV of the equation for the length?

8. Given the equation, find all the possible Non Permissible Values:

$$\frac{1}{x + \frac{2}{x+3}}$$

9. Challenge: Simplify and find all NPV's

$$\frac{\frac{x-2}{2x} + \frac{1}{x+2}}{\frac{3}{2} - \frac{6}{x^2+2x}}$$