

MONTGOMERY COLLEGE
 Department of Mathematics
 Rockville Campus

MA 103 KATIRAI KATIRAIE QUIZ #6A Part II SECTIONS (6.1 - 6.4) FALL 2006

NAME Solution

SCORE: / 10

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- 1) State the domain of the following functions.
 Write your answer in set-builder notation:

a) $f(x) = \frac{1}{x+3}$

Domain is all Reals except -3
 $\{x \mid x \text{ is all } \mathbb{R}; x \neq -3\}$

b) $g(x) = \frac{1}{x^2+4}$

$\{x \mid x \text{ is } \mathbb{R}\}$

c) $h(x) = \frac{1}{3x+4}$

$\{x \mid x \text{ is all } \mathbb{R}; x \neq -\frac{4}{3}\}$

d) $f(t) = 15t^2 - 11t + 2$

$\{x \mid x \text{ is } \mathbb{R}\}$

- 2) Solve the following rational equations

a) $\frac{6}{2x+1} = x$

$x(2x+1) = 6$
 $2x^2 + x - 6 = 0$
 $(2x-3)(x+2) = 0$

$2x-3=0$
 $2x=3$

$x = \frac{3}{2}$

$x+2=0$
 $x = -2$

b) $\frac{x}{x+1} = \frac{2x+1}{x+1}$

$x(x+1) = (2x+1)(x+1)$
 $x^2+x = 2x^2+3x+1$
 $x^2+2x+1=0$
 $(x+1)(x+1)=0$

$x = -1$

No Solution

3) Simplify the expression:

$$a) \frac{b^2+1}{b^2-1} \cdot \frac{b-1}{b+1}$$

$$= \frac{(b^2+1)(b-1)}{(b+1)(b-1)(b+1)} = \frac{b^2+1}{(b+1)(b+1)}$$

$$b) \frac{2x+4}{x+1} \div \frac{x^2+3x+2}{4x+2}$$

$$= \frac{2(x+2)}{x+1} \cdot \frac{2(2x+1)}{(x+2)(x+1)}$$

$$= \frac{4(2x+1)}{(x+1)^2}$$

4) Simplify

$$a) \frac{2x}{x-5} - \frac{x}{x+5}$$

$$= \frac{2x(x+5)}{(x+5)(x-5)} - \frac{x(x-5)}{(x+5)(x-5)}$$

$$= \frac{2x^2+10x - x^2+5x}{(x+5)(x-5)} = \frac{x^2+15x}{(x+5)(x-5)}$$

$$b) \frac{x}{2x-1} + \frac{1-x}{3x}$$

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

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

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

5) Solve

$$a) \frac{1}{x+5} = \frac{2}{2x+1}$$

$$2x+1 = 2(x+5)$$

$$\begin{array}{r} 2x+1 = 2x+10 \\ -2x \quad -2x \\ \hline 1 \neq 10 \end{array}$$

No solution

$$b) \frac{2x}{x+1} = \frac{3}{7}$$

$$3(x+1) = 2x(1)$$

$$\begin{array}{r} 3x+3 = 2x \\ -2x \quad -2x \\ \hline x+3 = 0 \\ \hline x = -3 \end{array}$$