Math 0305, Sample Exam #2/Quiz #5 Name _____
EPCC Fall 2006

DUE September 28, 2006

Directions: Please read all questions carefully. Answer all parts of each question. Please circle or box your final answers. Show all work and justify all answers for full credit. Partial credit is always given for correct methods, partial correct calculations, and correct justification (rules, theorems, definitions, etc). Point values for each question are indicated in parentheses. Good luck.

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1) Simplify the rational expression.

a. $\frac{x^4-16}{x^4-x^2-12}$

b. $\dfrac{\frac{9}{y^2}-1}{1+\frac{3}{y}}$

2) State the domain of the rational function.

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

3) Briefly explain whether or not the following rational expressions are equal.

$$\frac{(2x-1)(x+1)}{x(x+1)} \stackrel{?}{=} \frac{(2x-1)}{x}$$

4) Perform the operation and simplify the resulting expression.

a. $$\frac{1}{x+3} - \frac{2x}{x^2+6x+9}$$

b. $$\left(\frac{(x+1)^2}{1-2x}\right)\left(\frac{2x-1}{x+1}\right)$$

5) A reservoir has 5 channels bringing water to it. The first channel can fill the reservoir in $\frac{1}{3}$ day acting by itself, the second channel in 1 day, the third in $\frac{5}{2}$ days, the fourth in three days, and the fifth in 5 days. If all the channels are open, how long does it take to fill the reservoir?

6) A sales executive traveled 32 miles by car and then an additional 576 miles by plane. If the plane traveled at nine times the speed of the car and the total trip took 3 hours, find the rate of speed of the car and plane.

7) If a bank account pays a dividend of $448 on a balance of $10,000, how much of a dividend would the same account type pay on a balance of $25,000?

8) In geometry the Volume of a cylinder is computed as a function of its radius and height using the following formula, $V = \pi r^2 h$. Solve this equation for the radius, r.