Lecture 03: Partial Fractions Decomposition, continued

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Question 1.

Which of the following are proper rational functions? (Enter the letter or letters corresponding to all correct answers as text.)

J
$$3x^{2} + 2x + 7$$

K $\frac{2x^{2} + 7x}{x^{44} + 4\sqrt{x}}$
L $\frac{x+2}{x^{2}+2}$
M $\frac{x^{3} + 2x}{x^{3} + 3x^{2} + 1}$
N $\frac{1 + 2x + 3x^{2}}{x^{3} + 2x^{2} + 3x + 4}$

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Question 1.

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J $3x^{2} + 2x + 7$ K $\frac{2x^{2} + 7x}{x^{44} + 4\sqrt{x}}$ L $\frac{x+2}{x^{2}+2}$ M $\frac{x^{3} + 2x}{x^{3} + 3x^{2} + 1}$ N $\frac{1 + 2x + 3x^{2}}{x^{3} + 2x^{2} + 3x + 4}$

L,N.

The function $3x^2 + 2x + 7$ is the quotient $(3x^2 + 2x + 7)/1$, thus it is a rational function. The second choice, K, is not a rational function because of the term \sqrt{x} . The choices J,L,M, and N are rational functions, but only L and N are proper.

Question 2.

Enter the letters (O,P,Q,R,S) corresponding to all terms which appear in the partial fraction decomposition of

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

O
$$A/x$$

P $(Bx + C)/(x^2 + 1)$
Q $Hx^2/(x^4 + 2x^2 + 1)$
R $(Dx + E)/(x^2 + 1)^2$
S $(Fx + G)/(x^2 + 2)$

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Question 2.

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

O A/xP $(Bx + C)/(x^2 + 1)$ Q $Hx^2/(x^4 + 2x^2 + 1)$ R $(Dx + E)/(x^2 + 1)^2$ S $(Fx + G)/(x^2 + 2)$

O, P, and R appear in the partial fraction decomposition.

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Question 3.

Find the partial fraction decomposition for

$$\frac{2x+3}{x^2+3x} = \frac{A}{x} + \frac{B}{x+3}$$

and give the value of A. (Enter your answer as text.)

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Question 3.

Find the partial fraction decomposition for

$$\frac{2x+3}{x^2+3x} = \frac{A}{x} + \frac{B}{x+3}$$

and give the value of *A*. (Enter your answer as text.) The partial fraction decomposition is

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

Thus A = 1.

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