Lesson 96 Objective: SWBAT solve by using partial fraction decomposition.

Kickoff

1) Solve: $\frac{1}{x-5}+\frac{2}{x+3}$

2) Complete question 3 in the homework packet

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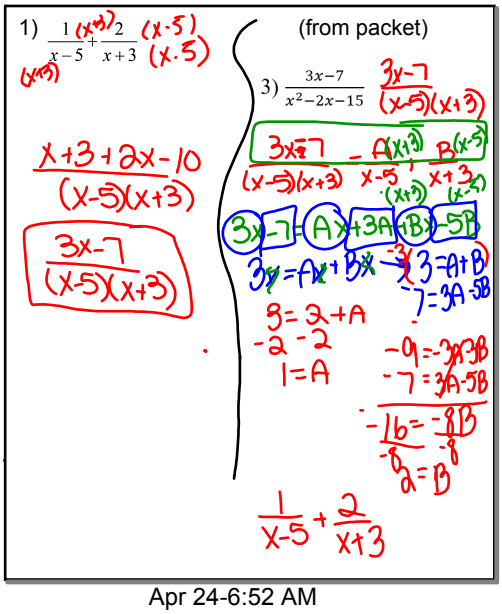

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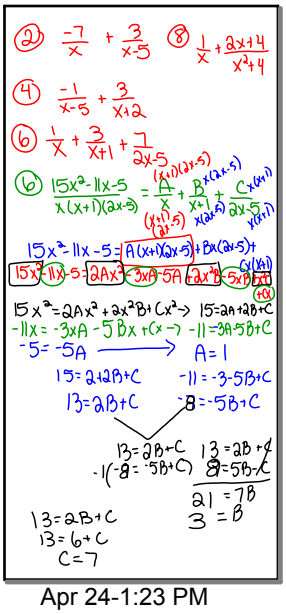

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3) $\frac{3x-7}{x^2-2x-15}$

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Partial Fractions- decomposing an algebraic fraction.

You are working backwards!! You are given the answer and must be able to come up with the fractions that you started with

Partial Fractions Steps:

1) Factor the denominator.
2) Write the factors as two separate fractions with A, B and C (however many needed) as numerators.
3) Find common denominators and start solving like a rational equation.
4) Set ONLY the numerators equal once you have common denominators.
5) Make two equations: one with x-values and the other with other numbers.
6) Solve for the missing letters by using a system! (A, B, C)
7) Write the fractions to show the decomposition.

When you set up the fractions with repeating factors, you need to write TWO partial fractions for it.

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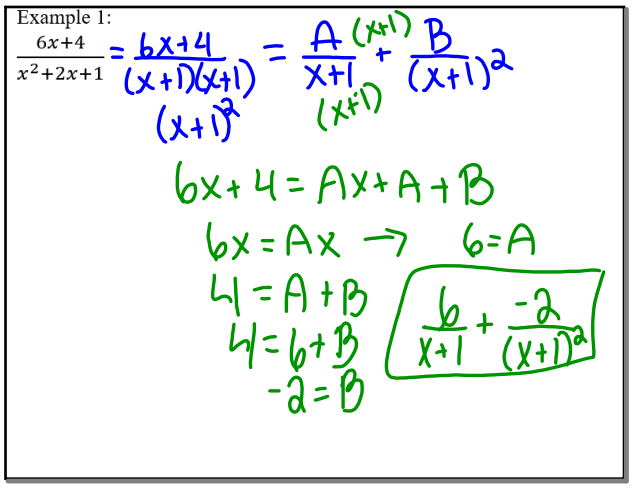

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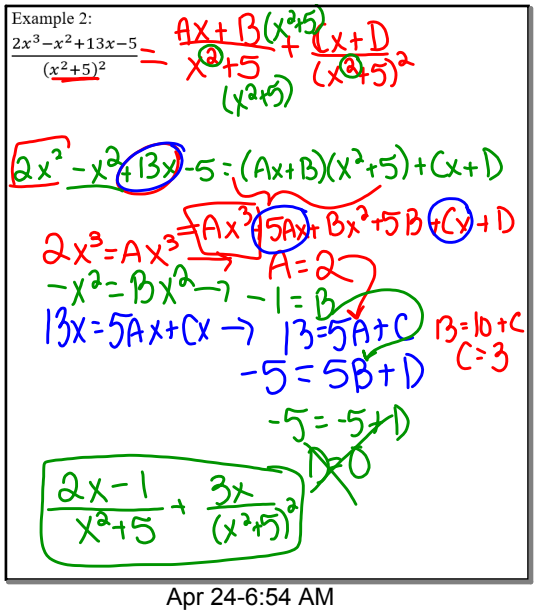
Example 2:
$\frac{2x^3-x^2+13x-5}{(x^2+5)^2}$
$= \frac{Ax+B}{x^2+5} + \frac{Cx+D}{(x^2+5)^2}$
(x^2+5)
$2x^3-x^2+13x-5 = (Ax+B)(x^2+5)+(Cx+D)$
$= Ax^3+5Ax+Bx^2+5B+Cx+D$
$2x^3 = Ax^3 \rightarrow A=2$
$-x^2 = Bx^2 \rightarrow -1 = B$
$13x = 5Ax+Cx \rightarrow 13 = 5A+C$
$13 = 10+C$
$C = 3$
$-5 = 5B+D$
$-5 = -5+D$
$D = 0$
$\frac{2x-1}{x^2+5} + \frac{3x}{(x^2+5)^2}$
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