7.3 Partial Fractions

Target 8G: Decompose rational expressions into partial fractions

Review of Prior Concepts

Simplify.

1. $\frac{3}{5}+\frac{21}{4}$

2. $\frac{2}{x}+\frac{1}{x-2}$

More Practice

Simplifying Rational Expressions

http://www.mathplanet.com/education/algebra-1/rational-expressions/add-and-subtract-rational-expressions

http://www.purplemath.com/modules/rtnladd.htm

https://www.khanacademy.org/math/algebra2/rational-expressions-equations-and-functions#adding-and-subtracting-rational-expressions

https://youtu.be/XTZl7Kn6u4Y

https://youtu.be/y_DweTAEYWk

Partial Fraction Decomposition

To **decompose a fraction** – write one fraction as the sum/difference of 2 or more fractions.

Example:

Write the terms for partial fraction decomposition of: $\frac{5x-1}{x^3(x+3)(x^2+1)}$

① Factor the denominator.

② Write each factor in its own fraction w/numerator as function that is one degree less than denominator. For repated factors, form fractions containing increasing powers of that factor in the denominator.

More Examples:

Write the terms for partial fraction decomposition of each:

1. $\frac{x-14}{x^2-4}$

2. $\frac{4x+4}{x^3+2x^2}$

3. $\frac{3x^2+4}{(x-3)(x+5)(x^2+1)}$

4. $\frac{5x^3-10x^2-5x-5}{(x^2+9)(x^2+4)}$

Decompose the Fraction

Example:

Decompose: $\frac{x-3}{x^2+3x}$

① Factor the denominator.

② Write each factor in its own fraction w/numerator as function that is one degree less than denominator. For repated factors, form fractions containing increasing powers of that factor in the denominator.

③ Solve for the constants: A,B,C, etc.

④ Write original fraction as decomposed fractions (partial fractions)

More Examples:

Decompose each fraction.

1. $\frac{x-14}{x^2-4}$

2. $\frac{7x-7}{x^2-3x-10}$

More Practice

Partial Fraction Decomposition

http://www.purplemath.com/modules/partfrac.htm
https://www.mathsisfun.com/algebra/partial-fractions.html
https://youtu.be/O14kJpRMY08
https://youtu.be/bqf42x6nZoo

Homework Assignment

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