

MATH1014.com

We Make Math Easy.

Test 1 Crash Course

Sponsored By



GRADESSAVERS

**Join The Gradesavers Weekly Tutoring Sessions!
Test Prep For MATH/CHEM/KINE & MORE!**

Partial Fractions

Partial Fractions

This technique is used for rational functions.

Step 1) Make sure the degree of the numerator is less than the degree of the denominator. If it is not, perform long division.

Step 2) Factor the denominator as much as possible and create individual partial fractions based on the factored denominator

Single Linear Factor

$$ax + b \rightarrow \frac{A}{ax+b}$$

Repeating Linear Factor

$$(ax + b)^n \rightarrow \frac{A}{ax+b} + \frac{B}{(ax+b)^2} + \frac{C}{(ax+b)^3} + \dots + \frac{Z}{(ax+b)^n}$$

Single Quadratic Factor

$$ax^2 + bx + c \rightarrow \frac{Ax+B}{ax^2+bx+c}$$

Repeating Quadratic Factor

$$(ax^2 + bx + c)^n \rightarrow \frac{Ax+B}{ax^2+bx+c} + \frac{Cx+D}{(ax^2+bx+c)^2} + \frac{Ex+F}{(ax^2+bx+c)^3} + \dots + \frac{Yx+Z}{(ax^2+bx+c)^n}$$

Step 3) Get rid of the denominators via multiplication and then solve for the constants A, B, C, etc by polynomial comparison.

Step 4) Integrate the partial fractions

Useful Formula's:

$$\int \frac{1}{x^2 + a^2} dx = \frac{1}{a} \tan^{-1} \left(\frac{x}{a} \right) + c$$

$$\int \frac{1}{bx \pm a} dx = \frac{1}{b} \ln|bx \pm a| + c$$

Partial Fractions

Partial Fractions

Practice writing the following rational functions as partial fractions.

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

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

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

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

$$\frac{2x + 1}{x^2(x^2 - 9)}$$

Recall:

Single Linear Factor

$$ax + b \rightarrow \frac{A}{ax+b}$$

Repeating Linear Factor

$$(ax + b)^n \rightarrow \frac{A}{ax+b} + \frac{B}{(ax+b)^2} + \frac{C}{(ax+b)^3} + \dots + \frac{Z}{(ax+b)^n}$$

Single Quadratic Factor

$$ax^2 + bx + c \rightarrow \frac{Ax+B}{ax^2+bx+c}$$

Repeating Quadratic Factor

$$(ax^2 + bx + c)^n \rightarrow \frac{Ax+B}{ax^2+bx+c} + \frac{Cx+D}{(ax^2+bx+c)^2} + \frac{Ex+F}{(ax^2+bx+c)^3} + \dots + \frac{Yx+Z}{(ax^2+bx+c)^n}$$

Partial Fractions

Example

$$\int \frac{x+2}{2x^2-3x-2} dx$$

Partial Fractions

Example

$$\int \frac{dx}{9 - x^2}$$

Partial Fractions

Example

$$\int \frac{10}{(x-1)(x^2+9)} dx$$

Partial Fractions

Example

$$\int \frac{x}{x+3} dx$$

Partial Fractions

Example

$$\int \frac{x^3 + 2x}{x + 2} dx$$

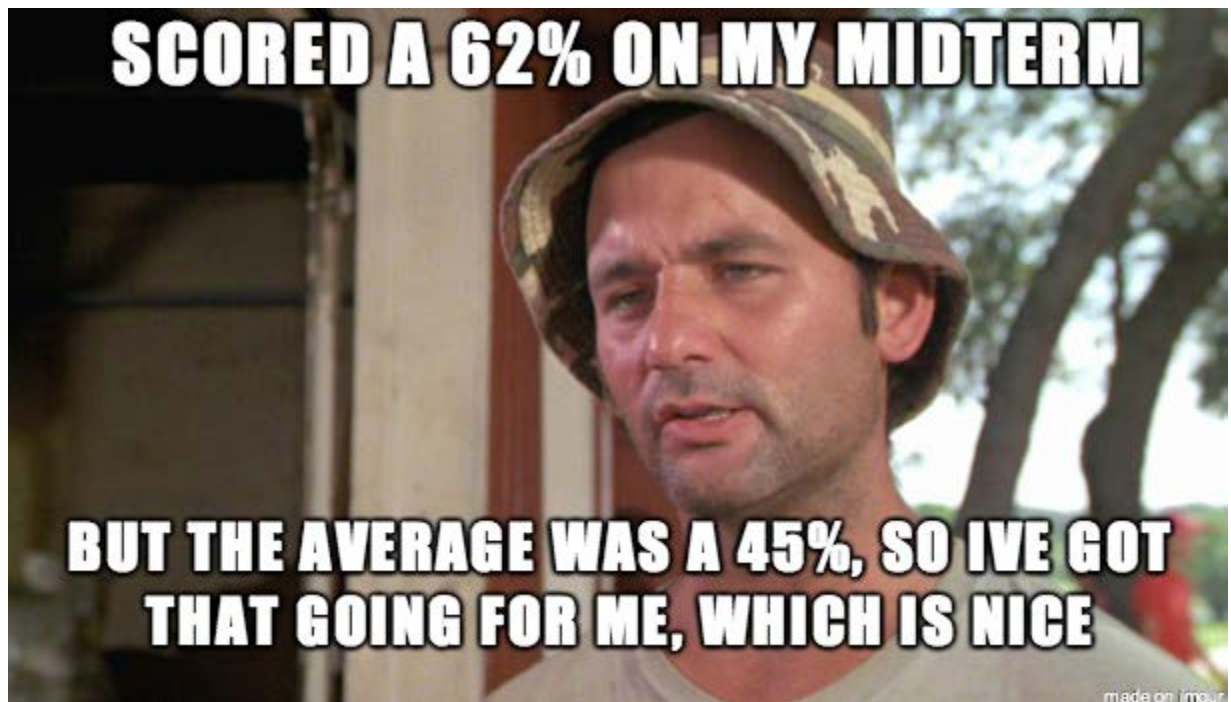
Partial Fractions

Example

$$\int \frac{x^2 - 4x - 1}{x - 1} dx$$

***Shoutout* To Our Sponsor For This
FREE Test Prep!**

We hope you found these tutorials useful in preparing for your test. If you like this style of teaching, considering checking out the Gradesavers Weekly Review Sessions for MATH 1014. Go to Gradesavers.com for dates and times!



Sponsored By



**Join The Gradesavers Weekly Tutoring Sessions!
Test Prep For MATH/CHEM/KINE & MORE!**