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## Partial Fractions 2ii

## A Level



## Part A Partial Fractions

Express  $\frac{x-1}{x(x+1)}$  in partial fractions.

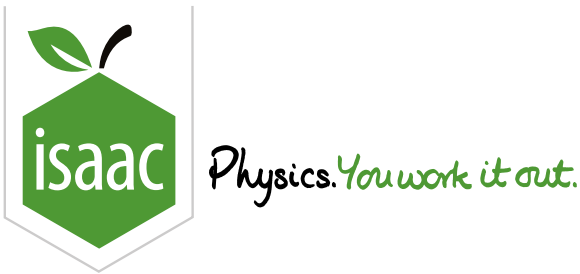
The following symbols may be useful:  $x$

## Part B Integral

Hence find the exact value of  $\int_1^2 \frac{x-1}{x(x+1)} dx$ .

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# Partial Fractions 1i

A Level

P

P

P

Part A

Partial Fractions

Express  $\frac{2+x^2}{(1+2x)(1-x)^2}$  in the form  $\frac{A}{1+2x} + \frac{B}{1-x} + \frac{C}{(1-x)^2}$ .

The following symbols may be useful:  $x$

Part B

Integration

Hence find  $\int_0^{\frac{1}{4}} \frac{2+x^2}{(1+2x)(1-x)^2} \, dx$  in exact form.

The following symbols may be useful:  $\int$ ,  $\ln$

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## Partial Fractions 4ii

## Partial Fractions 4ii

## A Level



## Part A Partial Fractions

Express  $\frac{7-2x}{(x-2)^2}$  in the form  $\frac{A}{x-2} + \frac{B}{(x-2)^2}$ , where  $A$ , and  $B$  are constants.

The following symbols may be useful:  $x$

## Part B Integral

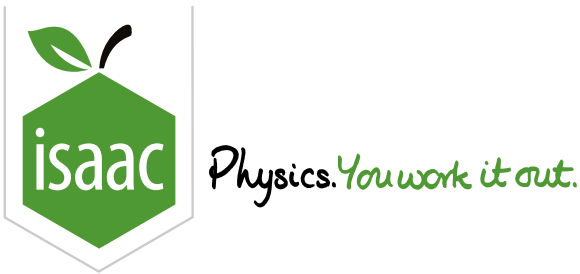
Hence find the exact value of  $\int_4^5 \frac{7-2x}{(x-2)^2} dx$ .

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# Integration by Substitution 4

Pre-Uni Maths for Sciences K3.4

A Level  
P P P

Part A   Integrate  $\frac{1}{b(x+a)}$

Find  $\int_0^a \frac{1}{b(x+a)} \, dx$ , where  $a$  and  $b$  are constants.

The following symbols may be useful:  $a$ ,  $b$ ,  $k$ ,  $x$

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Part B   Integrate  $\frac{x}{1+x^2}$

Find  $\int_0^1 \frac{x}{1+x^2} \, dx$ .

The following symbols may be useful:  $k$ ,  $x$

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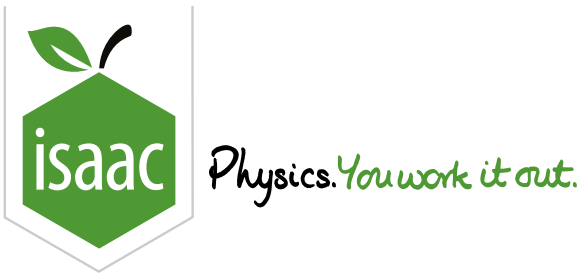
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# Integration by Substitution 5

Pre-Uni Maths for Sciences K3.5

A Level  
P P P

**Part A**   Integrate  $\frac{x^3}{a^5+ax^4}$

Find  $\int_a^{2a} \frac{x^3}{a^5+ax^4} dx$ , where  $a$  is a constant.

The following symbols may be useful: a

**Part B**   Integrate  $\tan \beta$

By writing  $\tan \beta = \frac{\sin \beta}{\cos \beta}$ , find  $\int_0^{\frac{\pi}{4}} \tan \beta \, d\beta$ .

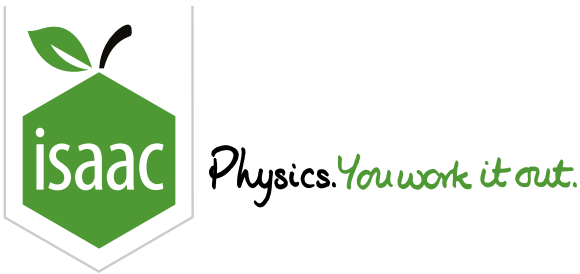
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# Algebraic Division 1ii

A Level

P

P

P

Part A

Quotient and Remainder

Find the quotient when  $3x^3 - x^2 + 10x - 3$  is divided by  $x^2 + 3$ .

The following symbols may be useful:  $x$

Give the remainder.

The following symbols may be useful:  $x$

Part B

Integral

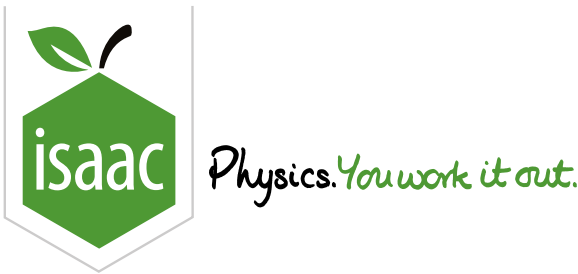
Hence find the exact value of

$$\int_0^1 \frac{3x^3 - x^2 + 10x - 3}{x^2 + 3} dx.$$

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# Integration with Partial Fractions 4

Pre-Uni Maths for Sciences K5.4

Further A  
P P P

Part A Find  $A$ ,  $B$  and  $C$

Write the function  $\frac{2z^2 - z - 3}{(z + 2)(z^2 - 2z - 1)}$  in the form  $\frac{A}{z + 2} + \frac{B + Cz}{z^2 - 2z - 1}$ .

Drag and drop the correct values in the expression below.

$$\frac{\boxed{\phantom{00}}}{z + 2} + \frac{\boxed{\phantom{00}} + \boxed{\phantom{00}}z}{z^2 - 2z - 1}$$

Items:

- 5

-4

-3

-2

-1

0

1

2

3

4

5

Part B Integrate

Hence find  $\int_1^2 \frac{2z^2 - z - 3}{(z + 2)(z^2 - 2z - 1)} \, dz$ .

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