***Section* 5.2 – Partial Fraction Decomposition**

1. **Decompose , where *Q* has Only Non-repeated Linear Factor**

Under the assumption that *Q* has only non-repeated linear factors, the polynomial *Q* has the form



Where no 2 of the number  are equal. In this case, the partial fraction decomposition of  is of the form



Where the numbers  are to be determined.

***Example***

Write the partial fraction decomposition of 

***Solution***

First factor the denominator, 







 







Therefore; 

1. **Decompose , where *Q* has Repeated Linear Factors**

If a polynomial *Q* has a repeated linear factor, say  *n* is an integer, then in the partial fraction decomposition of , we allow for the terms



Where the numbers  are to be determined.

***Example***

Write the partial fraction decomposition of 

***Solution***

First factor the denominator, 













***Example***

Write the partial fraction decomposition of 

***Solution***





Let 



Let 

















1. **Decompose , where *Q* has a Non-repeated Irreducible Quadratic Factor**

If *Q* contains a no-repeated irreducible quadratic factor of the form , then in the partial fraction decomposition of , we allow for the term



Where the numbers *A* and *B* are to be determined.

***Example***

Write the partial fraction decomposition of 

***Solution***



















1. **Decompose , where *Q* has a Repeated Irreducible Quadratic Factor**

If *Q* contains a repeated irreducible quadratic factor of the form , *n* an integer, then in the partial fraction decomposition of , we allow for the terms



Where the numbers are to be determined.

***Example***

Write the partial fraction decomposition of 

***Solution***











***Exercises Section* 5.2 – Partial Fraction Decomposition**

Write the partial fraction decomposition of each rational expression

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