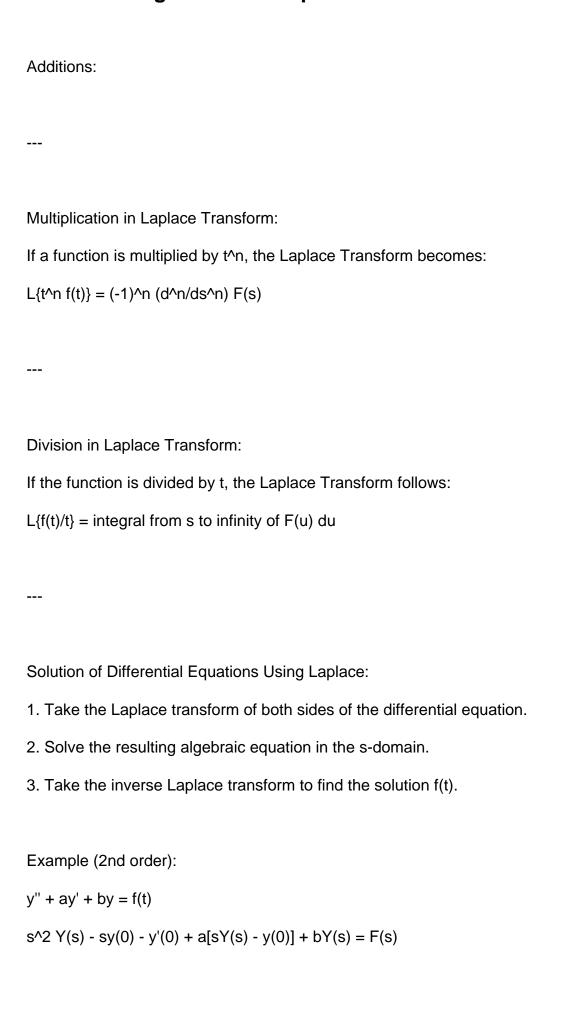
Integration and Laplace Transform Formula Cheat Sheet



Dirac Delta Function in Laplace Transform:

 $L{delta(t - a)} = e^{(-as)}$

Integration and Laplace Transform Cheat Sheet:

1. Power Rule for Integration:

integral of $x^n dx = (x^n(n+1))/(n+1) + C$ (for n not equal to -1)

2. Logarithmic Rule:

integral of $1/x dx = \ln |x| + C$

3. Integration of Constant:

integral of a dx = ax + C

4. Exponential Function:

integral of $e^x dx = e^x + C$

5. Trigonometric Functions:

integral of sin(x) dx = -cos(x) + C

integral of cos(x) dx = sin(x) + C

6. Logarithmic Form for Integrals:

integral of 1/(ax + b) dx = (1/a) ln |ax + b| + C

7. Hyperbolic Functions:

integral of sinh(x) dx = cosh(x) + C

integral of cosh(x) dx = sinh(x) + C

8. Gamma Function:

Gamma(n) = integral from 0 to infinity of $x^{(n-1)} e^{(-x)} dx = (n-1)!$

Laplace Transform Formulas:

1.
$$L\{e^{(at)}\} = 1/(s-a)$$

2.
$$L\{\sin(at)\} = a/(s^2 + a^2)$$

3.
$$L(\cos(at)) = s/(s^2 + a^2)$$

4.
$$L\{\sinh(at)\} = a/(s^2 - a^2)$$

5.
$$L\{cosh(at)\} = s/(s^2 - a^2)$$

Inverse Laplace Transform Formulas:

- 1. Inverse Laplace of 1/s = 1
- 2. Inverse Laplace of $n!/s^{n+1} = t^n$

- 3. Inverse Laplace of $1/(s-a) = e^{(at)}$
- 4. Inverse Laplace of $a/(s^2 + a^2) = sin(at)$
- 5. Inverse Laplace of $s/(s^2 + a^2) = cos(at)$