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### Cálculo C - Lista 16

Transformada de Laplace (II):

Transformada de Laplace inversa

Encontre a transformada de Laplace inversa das seguintes funções

1.  $\frac{1}{s^2+9}$

2.  $\frac{s-4}{s^2-4}$

3.  $\frac{2}{s} + \frac{1}{s+2}$

4.  $\frac{1}{s^5} + \frac{1}{s^2}$

5.  $\frac{1}{s(s+1)}$

6.  $\frac{1}{s^2+3s}$

7.  $\frac{1}{(s-a)(s-b)}$ , ( $a \neq b$ )

8.  $\frac{5}{(s-2)^7}$

9.  $\frac{s+2}{(s+2)^2+1}$

10.  $\frac{1}{s} \left( \frac{\omega}{s^2+\omega^2} \right)$

11.  $\frac{1}{s^2+3s+2}$

12.  $\frac{1}{s^2+4s+4}$

13.  $\frac{s}{s^2+4s+2}$

14.  $\frac{s}{(s+a)^2+b^2}$

15.  $\frac{s^2}{(s+1)(s+2)(s+3)}$

16.  $\frac{1}{(s-1)^2(s+2)}$

17.  $\frac{s^2-3s}{(s-2)(s-1)^2}$

18.  $\frac{3s^2+4}{s^4+s^2}$

# Lista 16 - Respostas

$$\frac{1}{3} \sin 3t$$

$$\cosh 2t - 2 \sinh 2t$$

$$2 + e^{-2t}$$

$$\frac{t^4}{4!} + t$$

$$1 - e^{-t}$$

$$\frac{1}{3} (1 - e^{-3t})$$

$$\frac{e^{at} - e^{bt}}{a - b}$$

$$\frac{e^{2t} t^6}{144}$$

$$e^{-2t} \cos t$$

$$\frac{1}{\omega} (1 - \cos \omega t)$$

$$e^{-t} - e^{-2t}$$

$$t e^{-2t}$$

$$e^{-2t} (\cosh \sqrt{2} t - \sqrt{2} \sinh \sqrt{2} t)$$

$$e^{-at} \left( \cos bt - \frac{a}{b} \sin bt \right)$$

$$\frac{1}{2} e^{-t} - 4 e^{-2t} + \frac{9}{2} e^{-3t}$$

$$-\frac{1}{9} e^t + \frac{1}{3} e^t t + \frac{1}{9} e^{-2t}$$

$$17. -2 e^{2t} + 3 e^t + 2t e^t$$

$$18. 4t - \sin t$$