**Universidade de Aveiro**
**Departamento de Matemática**

**Cálculo II - Agrupamento 4** **2013/14**

**Folha 1:** *Soluções*

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1. (a) $\dfrac{6}{s^2+9}+\dfrac{1}{s^2}-\dfrac{5}{s+1}\,, \quad s>0;$

   (b) $\dfrac{s-2}{(s-2)^2+25}\,, \quad s>2;$

   (c) $\dfrac{1}{(s-3)^2}\,, \quad s>3;$

   (d) $\dfrac{\pi}{s}-\dfrac{5\cdot 10!}{(s+1)^{11}}\,, \quad s>0;$

   (e) $\dfrac{6s}{(s^2+1)^2}-\dfrac{1}{s^2+1}\,, \quad s>0;$

   (f) $\dfrac{1}{s^2+1}+e^{-\pi s}\dfrac{1}{s^2+1}\,, \quad s>0;$

   (g) $e^{-2s}\dfrac{2!}{(s-2)^3}\,, \quad s>2.$

2. (a) $2\cosh(3t)=e^{3t}+e^{-3t}\,, \quad t\geq 0;$

   (b) $\dfrac{t^6}{180}\,, \quad t\geq 0;$

   (c) $\dfrac{1}{3}e^{t}-\dfrac{1}{3}e^{-2t}\,, \quad t\geq 0;$

   (d) $\dfrac{e^{-2t}}{\sqrt{2}}\operatorname{sen}(\sqrt{2}t)\,, \quad t\geq 0.$

3. $\dfrac{10!}{2^{11}}.$

4. $f(t)=\dfrac{1}{3}e^{t}+\dfrac{5}{3}e^{-2t}.$

5. (a) $\dfrac{s^2-16}{(s^2+16)^2}-\dfrac{2s}{s^2+16}+\dfrac{s+2}{(s+2)^2+16}\,, \quad s>0;$

   (b) $e^{2t}\left(2\cos(\sqrt{2}\,t)+\dfrac{3}{\sqrt{2}}\operatorname{sen}(\sqrt{2}\,t)\right)\,, \quad t\geq 0.$

6. $\dfrac{1}{4}\,e^{t}-\dfrac{1}{4}\,e^{-t}\cos(2t)+\dfrac{3}{4}\,e^{-t}\operatorname{sen}(2t), \quad t\geq 0.$