Instituto Politécnico de Bragança
Escola Superior de Tecnologia e Gestão

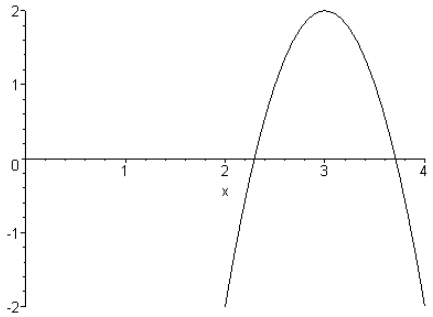
Análise Matemática I – 2003/04

Soluções das Ficha Prática nº2 – 2ª Parte

1) c)

2)

a)



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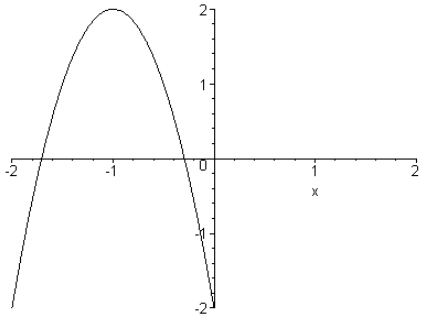
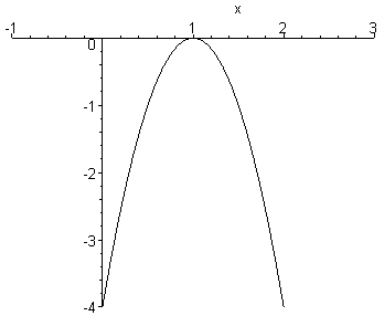
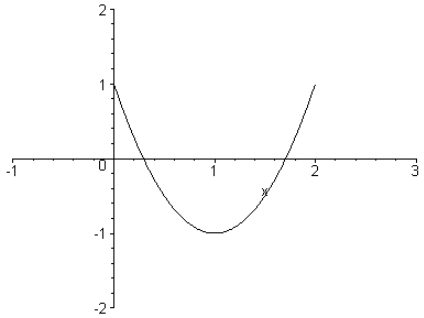


c)



d)

e)



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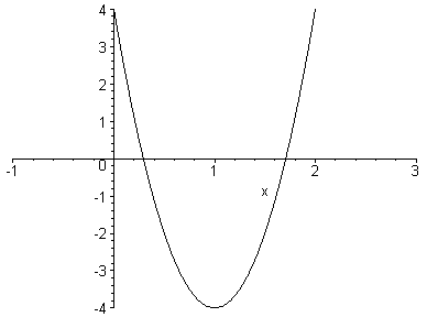
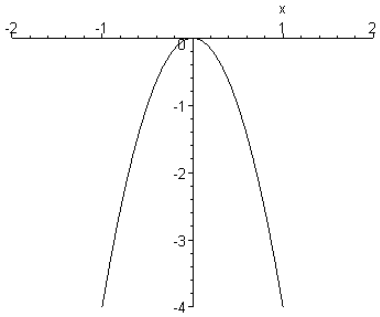
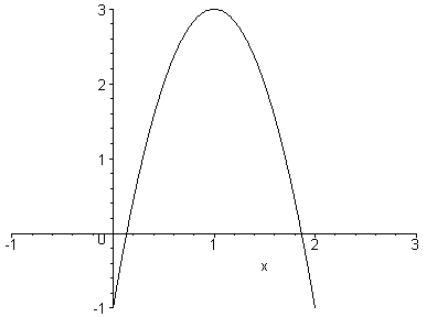
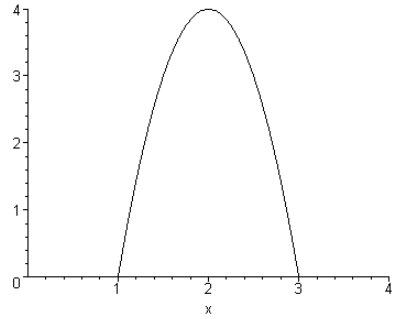


g)



h)





3) B

4) **4a)** Figura 5.2 **4b)** Figura 5.4 **4c)** Figura 5.5

5) B

6) D

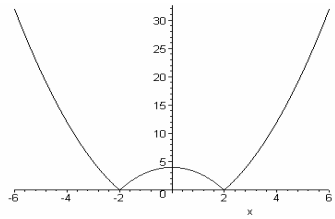
7) C

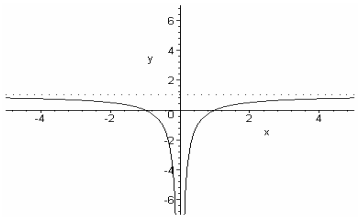
8) C

9) C

10) **10a.1)** 1/2 **10a.2)** -4

10b)





10c.1) $x \in \left]-2, 0\right[\cup \left]1, 2\right[$ **10c.2)** $x \in \left]-\infty,\ 0\right[\cup \left[1,\ +\infty\right[$

10d) $y = x^2 - 4$

11) **11a)** $\left]0, \frac{1}{6}\right]$ **11b)** $(f \circ g)(x) = \sqrt{\frac{1}{2x} - 3}$

12) **12a)** **12b)**

$f \circ g : \left]-\infty,\ \frac{4}{3}\right[\rightarrow \Re$ $\quad x \mapsto \sqrt{\frac{1}{4-3x}}$

$g \circ f : \Re^+ \rightarrow \Re$ $\quad x \mapsto 4 - 3\sqrt{\frac{1}{x}}$

13)

$$f \circ g: \quad \Re \rightarrow \Re$$

$$x \mapsto \begin{cases} 5x^3 & se \quad x \leq 0 \\ -x^3 & se \quad 0 \leq x \leq 2 \\ x\sqrt{x} & se \quad x > 2 \end{cases}$$

14) C e D.

15) B

16) Não.

17) $f(x) = x$

18) C

19) **19a)** $D = [-3, +\infty[\quad CD = [5, +\infty[$

19b) $f^{-1}: [5, +\infty[\rightarrow [-3, +\infty[$, $x \mapsto (x-5)^2 - 3$

19c) $S = \{\ \}$

20)

20a) $f^{-1}: \Re_0^+ \rightarrow \Re_0^+$, $x \mapsto x^2$ e $g^{-1}: \Re \setminus \{1\} \rightarrow \Re \setminus \{1\}$, $x \mapsto \dfrac{x+5}{x-1}$

20b)

$$(f \circ g)^{-1}: \Re \setminus \{-1;1\} \rightarrow\ ]-\infty;-5] \cup]1;+\infty[$$

$$x \mapsto \frac{x^2+5}{x^2-1}$$

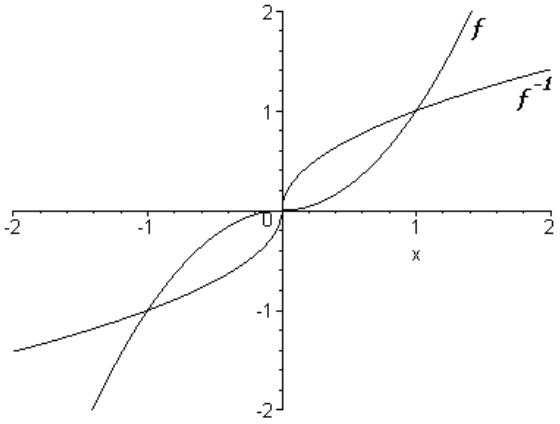
$(f \circ g)^{-1}(x) = (g^{-1} \circ f^{-1})(x)$

21)

$$f^{-1}: \Re \rightarrow \Re$$

a) $$x \mapsto \begin{cases} \sqrt{x} & , x \geq 0 \\ -\sqrt{-x} & , x < 0 \end{cases}$$

b)



Conclui-se que o gráfico de f e de f^{-1} são simétricos relativamente à recta $y = x$ (bissectriz dos quadrantes impares).

22) C

23) B

24) B