ESCOLA SECUNDÁRIA DE CASQUILHOS 11º Ano Turma **A** **2012/2013**

FICHA DE TRABALHO – Matemática A **Soluções**

1.

1.1. $x=4$ **1.2.** $x=-4-\sqrt{11}\ \vee\ x=-4+\sqrt{11}$ **1.3.** $x=-1\ \vee\ x=\frac{1}{4}$

2.

2.1. $\left]-\frac{1}{2};0\right[$ **2.2.** $]-\infty;0[\,\cup\,]3;+\infty[$ **2.3.** $]-\infty;1[\,\cup\,[31;+\infty[$

2.4. $]-\infty;-4]\cup[4;+\infty[$ **2.5.** $\left]-\infty;-\frac{1}{2}\right[\cup\left]0;\frac{1}{4}\right[\cup\ [1;+\infty[$ **2.6.** $[-1;1[\,\cup\,]4;6]$

3.

3.1. $D_f=D_g=\mathbb{R}\setminus\{2\}\,;D_h=\mathbb{R}\setminus\{3\}$

3.2.1. $D_{f+g-h}=\mathbb{R}\setminus\{2,3\}$ $(f+g-h)(x)=\frac{5x^2-x-32}{(2x-4)(x-9)}$

3.2.2. $D_{f\times g}=\mathbb{R}\setminus\{2\}$ $(f\times g)(x)=\frac{-x}{(x-2)^2}$

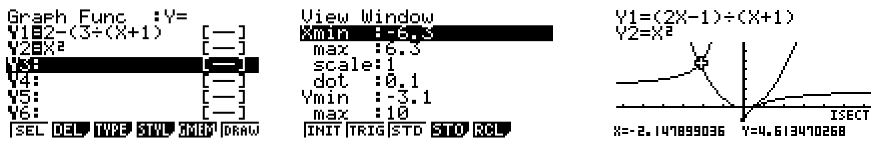
3.2.3. $D_{\frac{f}{g}}=\mathbb{R}\setminus\{2\}\cap\left\{x\in\mathbb{R}:\frac{2}{x-2}\neq 0\right\}=\mathbb{R}\setminus\{2\}$ $\left(\frac{f}{g}\right)(x)=-\frac{x}{2x-4}\div\frac{2}{x-2}=-\frac{x}{2x-4}\times\frac{x-2}{2}=-\frac{x}{4}$

4.

4.1. $D_f=\mathbb{R}\setminus\{-1\}$ $D'_f=\mathbb{R}\setminus\{2\}$

4.2. Eixo dos XX (zeros) $\left(\frac{1}{2};0\right)$ Eixo dos YY $(0;-1)$

4.3. $f(x)\geq 3\Leftrightarrow 2-\frac{3}{x+1}\geq 3\Leftrightarrow\frac{-x-4}{x+1}\geq 0\ \ (quadro\ de\ sinais)$ $C.S.=\ [-4;-1[$

4.4. 

$C.S.=\ ]-\infty;-2{,}15[$

5.

5.1. $D_f=\mathbb{R}\setminus\{3\}$ Zero $x=-6$

5.2. Ponto $(0;-2)$

5.3. C.S. $]-\infty;0[\,\cup\,]3;6]$

5.4. $y=1+\frac{9}{x-3}$ A.V. $x=3$ A.H. $y=1$

5.5. $\vec{v}=(3,1)$

6.

6.1. A.V. $x=8$ A.O. $y=-x-8$

6.2. $h(x)=\frac{x^2+x-12}{x+2}$ e $D_h=\mathbb{R}\setminus\{-2,2\}$

6.3. $g(x)>\frac{1}{x}\Leftrightarrow\frac{x^3-8}{8x-x^2}>0$ C.S. $]-\infty;0[\,\cup\,]2;8[$ logo as soluções naturais são $\{3,4,5,6,7\}$

7.

7.1. $\frac{2x^2+x-1}{x-3} = -\frac{11}{2} \Leftrightarrow x = \frac{7}{4} \vee \ x = -5$

7.2. $j(x) = 2x + 7 + \frac{20}{x-3}$

7.3. A.O. $y = 2x + 7$ e A.V. $x = 3$

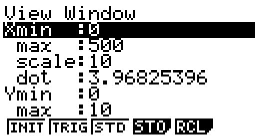
8.

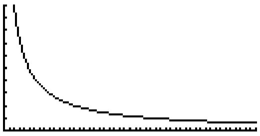
8.1. $C(590) = \frac{300}{590+10} = 0{,}5$€

8.2. $C(x) = \frac{300}{x+10} = 1{,}5 \Leftrightarrow x = 190 \ peças$

8.3. $\frac{300}{x+10} < 3 \Leftrightarrow x > 90$ serão precisas no mínimo 91 peças.

8.4.

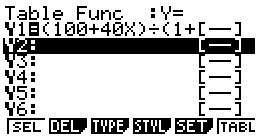


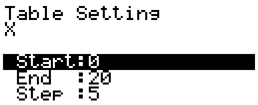


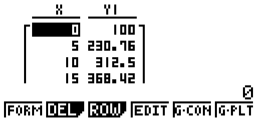
Quando o número de peças produzidas aumenta muito o custo médio por peça decresce e tende para zero.

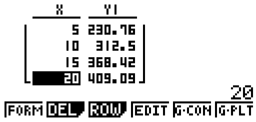
9.

9.1.



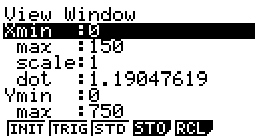


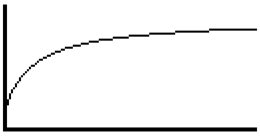




t	0	5	10	15	20
$N \ (número \ de \ peixes)$	100	230	312	368	409

9.2.





Afirmação verdadeira. Com o decorrer do tempo o número de peixes no lago tende em estabilizar nos 666 peixes (aproximadamente) – A.H $y = \frac{2000}{3}$.

9.3.

$N(t) = 2\,N(0) \Leftrightarrow \frac{20(5+2t)}{1+0{,}06t} = 200 \Leftrightarrow t \approx 3{,}57$ Serão necessários cerca de 3 anos e meio.

Graficamente