1a) $x^2 - 5x + 6 \neq 0$

$$\frac{5 \pm \sqrt{-5^2 - 4 \times 1 \times 6}}{2 \times 1} = \frac{5 \pm \sqrt{25 - 24}}{2} =$$

$$\frac{5+1}{2} = \frac{6}{2} = 3$$

$$\frac{5-1}{2} = \frac{4}{2} = 2$$

$Df =]-\infty, 2[\cup]2, 3[\cup]3, +\infty[$

b) $4 - x^2 \geqslant 0 \Leftrightarrow -x^2 \geqslant -4 \Leftrightarrow x^2 \leqslant 4 \Leftrightarrow x \leqslant 2$

$Dg = [-2, 2]$

c) $2x - 6 > 0 \Leftrightarrow 2x > 6 \Leftrightarrow x > \frac{6}{2} \Leftrightarrow x > 3$

$Dh =]3, +\infty[$

2a) $\lim\limits_{x \to 3} = \frac{x^2 - 9}{x - 3} = \lim\limits_{x \to 3} \frac{\cancel{(x-3)}(x+3)}{\cancel{x-3}} =$

$\lim\limits_{x \to 3} x + 3 = 3 + 3 = 6$

b) $\lim\limits_{x \to +\infty} \frac{5x^2 - 3x + 1}{2x^2 + 7} \; (/x^2) = \lim\limits_{x \to +\infty} \frac{5 - \frac{3}{x} + \frac{1}{x^2}}{2 + \frac{7}{x^2}} = \frac{5}{2}$

c) $\lim\limits_{x \to 0} \frac{\sqrt{1+x} - 1}{x} = \frac{\sqrt{1+x} - 1}{x} \times \frac{\sqrt{1+x} + 1}{\sqrt{1+x} + 1} = \frac{(\cancel{1} + x) - \cancel{1}}{x(\sqrt{1+x} + 1)}$

? ?

$\frac{\cancel{x}}{\cancel{x}(\sqrt{1+x} + 1)} = \frac{1}{\sqrt{1+x} + 1} = \frac{1}{\sqrt{1+0} + 1} = \frac{1}{1+1} = \frac{1}{2}$

3) $f(2) = \frac{x^2-4}{x-2} = \frac{(x-2)(x+2)}{\cancel{x-2}} = x+2 = 2+2 = 4$

$K = 4$

4) $g(0) = x^3 - 4x + 1 = 0^3 - 4(0) + 1 = 1$

$g(2) = x^3 - 4x + 1 = 2^3 - 4(2) + 1 = 8 - 8 + 1 = 1$

não tem zeros entre $]0, 2[$

5) $\lim_{x \to 3^+} \frac{2x+1}{x-3} = \frac{2(3)+1}{3-3} = \frac{7}{0^+} = +\infty$

$\lim_{x \to +\infty} \frac{2x+1}{x-3} \ (/x) = \frac{2 + \frac{1}{x}}{1 - \frac{3}{x}} = 2$

$AV = 3$

$AH = 2$

6)
a) $4x^3 - 6x + 5$

b) $5(2x+1)^4 \times 2$

c) $\frac{2x(x+3) - (x^2-1)}{(x+3)^2}$

d) $e^{x^2+1} \cdot 2x$

7) $f(1) = x^3 - 2x = 1^3 - 2(1) = -1$

$f'(1) = 3x^2 - 2 = 3(1)^2 - 2 = 1$

Ponto $= (1, -1)$

Reta $= 1$

8) a) $\int 4x^3 - 6x + 2\,dx = \cancel{\frac{4x^4}{4}} - \frac{6x^2}{2} + 2x =$

$x^4 - 3x^2 + 2x + c,\ c \in \mathbb{R}$

b) $\int \frac{2x}{x^2+1}\,dx = \ln(x^2+1) + c,\ c \in \mathbb{R}$

c) $\int x \cdot e^x\,dx = \frac{x^2}{2} \cdot e^x - \int e^x\,dx =$

$\frac{x^2}{2} \cdot e^x - e^x + c,\ c \in \mathbb{R}$

d) $\int \ln(x)\,dx = x \cdot \ln(x) - x + c,\ c \in \mathbb{R}$

9) $\int_0^2 3x^2 - 4x + 1\,dx = \left[x^3 - 2x^2 + x\right]_0^2 =$

$2^3 - 2(2)^2 + 2 = 8 - 8 + 2 = 2$

10) $f(1) = 3\ln(x) + x^2 + c = 5,\ c = 4$

11) $\int_{-2}^{2} 4 - x^2\,dx = \left[4x - \frac{x^3}{3}\right]_{-2}^{2} = 4(2) - \frac{2^3}{3} - 4(-2) - \frac{(-2)^3}{3}$

$= \underset{(\times 3)}{\frac{8}{1}} - \frac{8}{3} + \underset{(\times 3)}{\frac{8}{1}} - \frac{-8}{3} = \frac{24}{3} - \frac{8}{3} + \frac{24}{3} - \frac{-8}{3} =$

$= \frac{16}{3} + \frac{24}{3} - \frac{-8}{3} = \frac{40}{3} - \frac{-8}{3} = \frac{48}{3} = 16$