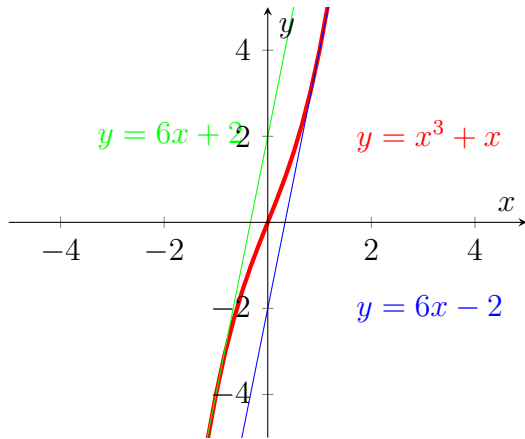

MAT1351 — Lista 5
Prof. Kostiantyn Iusenko

1. a) $12(x^2 + x)^3(2x + 1) - 15x^2 \sin(x^3)$;
b) $\frac{e^{x^4} 4x^3(x^2+1) - 2xe^{x^4}}{(x^2+1)^2}$;
c) $20x^4 \ln(x^2 + 1)(x^5 + 1)^3 + \frac{2x(x^5+1)^4}{x^2+1}$;
d) $\frac{2(5x^2+6x^6)(10x+36x^5)(x^2+1) - 2x(5x^2+6x^6)^2}{(x^2+1)^2}$;
e) $\frac{2(x+1)^3(-x(x+1)+2)}{e^{x^2}}$;
f) $-\frac{3(4x^3 \cos(x^4) - 5x^4 \sin(x^5))}{(\sin(x^4) + \cos(x^5))^2}$;
g)
h) $e^{4x^3+3x^2}(12x^2 + 6x) + 8x \ln(x^5 + 4x^4)(x^2 + 1)^3 + \frac{(5x+16)(x^2+1)^4}{x(x+4)}$;
i) $\frac{3x^2 \sec(x^4)}{2\sqrt{x^3}} + \frac{4x^3 \tan(x^4)\sqrt{x^3}}{\cos(x^4)}$;
j) $15e^{x^5}x^4 + \frac{30}{x}$;
k) $e^{(x^2+x+1)^3}3(x^2 + x + 1)^2(2x + 1)$;
l) $12x^2 \cos(x^3) - \frac{5x^4}{\sin^2(x^5)}$;
m) $4(2x + 6x^2) + 3(6e^{x^6}x^{10} + 5e^{x^6}x^4) + 14x^6$
n) $\frac{8x^2 \ln(x^5)(x^2+1)^3 - 5(x^2+1)^4}{x \ln^2(x^5)}$
o) $\frac{4x(x^2+4)}{3((x^2+4)^2)^{\frac{2}{3}}}$
p) $\frac{\cos(\sin(x)) + x \sin(\sin(x)) \cos(x)}{\cos^2(\sin(x))}$
q) $\frac{3x^5 \cos(x) + 13x^4 \sin(x) + 3x^4 \cos(x) + 12x^3 \sin(x) + 3x \cos(x) + 3 \cos(x) + \sin(x)}{3(x+1)^{\frac{2}{3}}}$
r)
2. a) Temos $f'(x) = 3x^2 + 3$ assim reta tangente paralela ao reta $y = 6x - 1$ em ponto x_0 se $3x_0^2 + 3 = 6$ ou seja $x_0 = -1$ ou $x_0 = 1$. Assim temos duas solues: $y - f(-1) = 6(x - (-1))$ ou $y - f(1) = 6(x - 1)$. No primeiro caso a reta

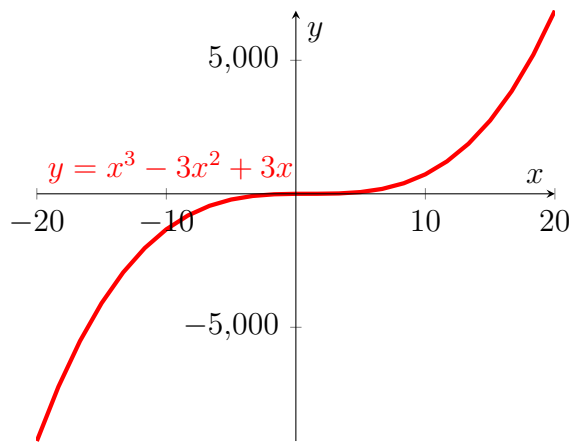
$$y = 6x + 2.$$

No segundo caso a reta

$$y = 6x - 2.$$



3. a)



b)

