Exemplos de questões da Primeira Fase

Calcule $\dfrac{dy}{dx}$.

1. $y = \frac{2}{3}\text{sen }^{\frac{3}{2}}x - \frac{2}{7}\cos^{\frac{7}{2}}x$
2. $y = \frac{(x+\pi)^3}{x^3+\pi^3} - \frac{e^{\cos x}+cos(e^x)}{e^{10}}$
3. $y = \ln\left(\sqrt{\frac{a^2+x^2}{a^2-x^2}}\right)$
4. $y = \cos(\text{sen }(\tan x)) + 2xe^{x\sqrt{x}}$
5. $\frac{x^2}{a^2y} + \frac{y^2}{b^2x} = 1$
6. $y = (x^3 - 2x)^{\ln x}$
7. $y = \tan^4\left(2 + \frac{(7-x)}{\sqrt{3x^2+5}}\right) - e^{\frac{x}{2}}\text{sen }(2x)$
8. $\sec(xy) + x\tan y = y - 1$
9. $y = \ln(\cos(x)) + \frac{\sqrt{x^2+1}}{x}$
10. $y = \text{sen }^3(\cos^2(x\sqrt{e^3x}))$
11. $y = e^{x\cos(x)} - x^2\sqrt[3]{\tan^3(x) + \sec(x)}$
12. $\frac{x^2}{2y} - \frac{y^2}{4y} = 1$
13. $y = \frac{\ln(x\sqrt{x^4+2})+x^6}{\sec^2(x)+1}$
14. $y = \text{sen }(\cos^3(\tan\frac{x}{2})) + x^2e^{x^2\sqrt{x}}$
15. $y = 2x(1-x^2)^3 + x\ln^3 x + \ln(\ln x^2)$
16. $\text{sen }(xy) + \frac{x^3}{\sqrt{x+1}} = e^{y^2} - 2$
17. $y = x^{\sqrt{x\ln x}}$
18. $y = \frac{2\sqrt{x}}{x+1} + x^2\text{sen }(3x) - 2\tan(\ln(\text{sen }2x))$
19. $y = \frac{10}{\sqrt[5]{x}} + \sqrt[3]{x}$
20. $y = \cos\left(x\,e^{x^2+1}\right)$

21. $\frac{x^2}{2y} - \frac{y^2}{4x} = 1000$

22. $y = \cos^3\left(\tan\left(\frac{x}{2}\right)\right) + x^2 e^{x\sqrt{x}}$

23. $y = x\ln^3 x + \ln\left(\ln\left(x^2\right)\right)$

24. $y = x^{\ln x}$

25. $y = \ln(x\sqrt{x^4+2}\,) - x\sqrt{x^4+2x}$

26. $y = \frac{\tan^2 x + x^2}{x^2 - \operatorname{sen} x}$

27. $y = x\sec\left(\frac{\cos^2(2x) - (e^x)^\pi}{\sqrt[7]{1-x}}\right)$

28. $y = e^{\cos\left(\operatorname{sen}\left(\ln\left(\sec\left(\tan\left(\sqrt{x}\right)\right)\right)\right)\right)}$