

Derivace I

Určete definiční obor a derivujte funkce:

1. $y = x^4 + \frac{1}{3}x^3 + 2,5x^2 - 3x + 2$

2. $y = ax^2 + bx^2 + c; a, b, c \in R$

3. $y = \frac{1}{x^3} - \frac{7}{x^2} + \frac{1}{5x}$

4. $y = 2\sqrt{x} - \frac{1}{x} + \sqrt[4]{x}$

5. $y = \frac{2x}{\sqrt{x}} + \frac{x\sqrt{x}}{\sqrt[3]{x}} - \frac{\sqrt{x}}{x}$

6. $y = x^2\sqrt{x} \cdot \ln 2$

7. $y = x(x^2 - \sqrt{x} + 1)$

8. $y = \sqrt{x}(x^3 + 2\sqrt{x} - 3)$

9. $y = (x^2 - 2x)(x^2 + 3x + 1)$

10. $y = (\sqrt{x} - 1)\left(\frac{1}{\sqrt{x}} + 1\right)$

11. $y = (x^2 - 1)(x^2 + 4)$

12. $y = \frac{x+1}{x-1}$

13. $y = \frac{2x-3}{4-x}$

14. $y = \frac{x}{x^2+1}$

15. $y = \frac{2}{x^3-1}$

16. $y = \frac{1}{x^2+x+1}$

17. $y = x \cdot \sin x$

18. $y = \frac{x}{1-\sin x}$

19. $y = \frac{\operatorname{tg} x}{x}$

20. $y = \cos^2 x$

21. $y = \cos x - \frac{1}{2}\cos^2 x$

22. $y = \frac{4\sin x}{1+\cos x}$

Vypočtěte hodnotu derivace funkce v daném bodě.

1. $y = 4x^3 - 3x^2; x = -1$

2. $y = \frac{1}{x+3}; x = \frac{1}{2}$

3. $y = \frac{1}{x^3} - \frac{7}{x^2} + \frac{1}{5x}; x = 1$

4. $y = (x^2 - 2x)(x^2 + 3x + 1); x = -2$

5. $y = \cot g(x); x = -\frac{\pi}{4}$

6. $y = \frac{4\cos x}{1-\sin x}; x = \frac{3}{2}\pi$

7. $y = \sin^2 x; x = \frac{\pi}{6}$