



 Derivatives

 Derivace

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1. Test 1



- Complete fields inside the following patterns for derivative and press **Enter**.
- You can see the correct answer clicking **Ans**.
- For comments concerning writing mathematical expressions see the file [instrukce.pdf](#).



- Doplňte derivaci a stiskněte **Enter**.
- Pokud jste neuspěli, zkuste znovu, nebo klikněte na **Ans**.
- Matematické výrazy zapisujte tak, jak je uvedeno v souboru [instrukce.pdf](#).



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3. $(-\ln(\cos(x)))' = -\frac{1}{\cos(x)} \cdot (-\sin(x))$ Správně Correct

4. $x^3 \cdot (-3x^2)$ Špatně Wrong

5. $(2 \arctan(x))' = \frac{2}{x^2+1}$

6. $(\frac{e^x}{x+1})' = 3 \cdot \frac{e^x(1) - e^x(1)}{(x+1)^2}$ Čtyř ikrát špatná odpověď Four-times incorrect answer

7. $(\frac{\ln x}{x^2})' = \frac{\frac{1}{x} \cdot x^2 - \ln x \cdot 2x}{x^4}$

8. $(x \sin^2 x)' = \sin^2 x + 2x \sin x \cos x$

9. $(\ln \frac{x+1}{x})' = \frac{x}{x+1} \cdot x$ Dvě kliknutí ukáží správné řešení Two clicks show correct answer

10. $(x^2 \cos x)' = 2x \cos x + x^2(-\sin x)$

11. $((x+2) \sin^3 x)' = 1 \cdot \sin^3(x) + (x+2) \cdot 3 \cdot \sin^2(x) \cdot \cos(x)$ Správne odpovědi, ale původně s jednou chybou. Correct answers, originally with one mistake.

$(\sin(2x))' = 2 \cos(2x)$



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Quiz

$$1. (e^{x^2})' = e^{\quad} \cdot 2x$$

$$2. \left(\sin \frac{1}{x}\right)' = \frac{1}{\sqrt{\quad}} \cdot (-1)x^{-2}$$

$$3. (-\ln(\cos(x)))' = -\frac{1}{\quad} \cdot (-\sin x)$$

$$4. (4e^{1-x^3})' = 4e^{1-x^3} \cdot (\quad)$$

$$5. (2 \operatorname{atan} \sqrt{x})' = \frac{2}{x+1}$$

$$6. \left(3 \frac{e^x}{x+1}\right)' = 3 \frac{e^x(\quad) - e^x}{\quad}$$

$$7. \left(\frac{\ln x}{x^2}\right)' = \frac{(\quad)x^2 - 2x \ln x}{\quad}$$

$$8. (x \sin^2 x)' = \sin^2 x +$$

$$9. \left(\ln \frac{x+1}{x}\right)' = \frac{x}{x+1}$$



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10. $(x^2 \cos x)' = \cos x + \quad \quad \quad (-\sin x)$

11. $((x+2) \sin^3 x)' = 1 \quad \quad \quad + (x+2)$

12. $\left(\frac{\sin(2x)}{x}\right)' = \frac{x - \quad \quad \quad}{x^2}$

13. $\left(\frac{e^{-x} + 1}{\sqrt{x}}\right)' = \frac{\sqrt{x} + (e^{-x} + 1)}{x}$

14. $\left(\operatorname{atan} \frac{x+1}{\sqrt{3}}\right)' = \frac{1}{\quad \quad \quad} \cdot \frac{1}{\sqrt{3}}$

15. $\left(\operatorname{atan} \sqrt{\sin x}\right)' = \frac{1}{1 + \sin x}$

16. $\left(\sin(x^2 \ln x)\right)' = \cos(x^2 \ln x)$

17. $\left(\sqrt{\frac{x}{\sin x}}\right)' = \frac{1}{2} \left(\frac{x}{\sin x}\right)^{-\frac{1}{2}} \frac{\quad \quad \quad}{\sin^2 x}$

18. $(e^x(x^2 + x + 1))' = e^x \left(\quad \quad \quad \right) + e^x \left(\quad \quad \quad \right)$
 $= e^x \left(\quad \quad \quad \right)$



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$$19. ((x + 5) \sin(x) - (x - 3) \cos x)' = 1 \quad + (\quad) \cos(x) \\ - \left[1 \quad + (x - 3)(\quad) \right] \\ = (\quad) \sin x + (\quad) \cos x$$


$$20. \left((x^2 + 2x + 5)e^{-2x} \right)' = (2x + 2)e^{-2x} + \quad e^{-2x} \\ = e^{-2x} (\quad)$$

$$21. \left(\ln \frac{x+1}{x-1} \right)' = \frac{1}{\quad} \cdot \frac{1}{(x-1)^2} =$$

2. Test 2

Quiz

 Find the derivative, simplify and write into the field.

 Zderivujte a upravte.

1. $(x^2 + 3)' =$

2. $\left(-\frac{1}{9}x^4 + \frac{2}{3}x^2 \right)' =$



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$$3. (4x^3 - 3x^4)' =$$

$$4. (-2 + 12x - x^3)' =$$

$$5. (x^2 + x)' =$$

$$6. ((x^2 + 2\sqrt{x})x)' =$$

$$7. \left(\frac{1+2x}{\sqrt{x}}\right)' =$$

$$8. (x^2e^x)' =$$

$$9. (xe^{x^2})' =$$

$$10. (\sqrt{x^2+1})' =$$

$$11. (\sin(x^3+x))' =$$

$$12. (e^{\sqrt{x}})' =$$

$$13. (\cos(2x-1))' =$$

$$14. \left(x + \frac{4}{x}\right)' =$$



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$$15. \left(\frac{x}{(x+1)^2} \right)' =$$

$$16. (x^2 - 2 \ln x)' =$$

$$17. (2\sqrt{x} - x)' =$$

$$18. \left(\frac{x}{1+x^2} \right)' =$$

$$19. \left(\frac{1+x^2}{1-x^2} \right)' =$$

$$20. (e^x(x^2 - 2x + 2))' =$$

$$21. ((x+1)e^x)' =$$

$$22. (x \ln(x+1))' =$$

$$23. (1 - \sqrt{3x+1})' =$$

$$24. ((x^2 + x + 2)^2)' =$$

$$25. (\sin(2x))' =$$

$$26. (e^{x^2})' =$$



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$$27. \left((x^2 + 1)^3 \right)' =$$

$$28. \left((x + 1) \ln(x^2 + 1) \right)' =$$

$$29. \left(\left(\frac{x - 1}{x + 1} \right)^2 \right)' =$$

$$30. \left(\frac{e^x}{x + 1} \right)' =$$

$$31. \left(x \ln(x^2 - 1) \right)' =$$

$$32. \left(\frac{1}{4} \ln \frac{x^2 - 1}{x^2 + 1} \right)' =$$

$$33. \left(\sqrt{x + 1} - \ln(1 + \sqrt{x + 1}) \right)' =$$

$$34. \left(\ln \frac{x + 1}{x - 2} \right)' =$$

$$35. \left(\ln(1 + \sin^2 x) \right)' =$$

$$36. \left(x^2 e^{-x} \right)' =$$

$$37. \left(e^{\tan x^2} \right)' =$$

$$38. (\ln \sin x)' =$$



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$$39. (x\sqrt{1-x^2})' =$$

$$40. (\operatorname{atan}(x+x^2))' =$$

$$41. \left(\operatorname{atan} \frac{x+1}{x}\right)' =$$

$$42. (x \ln^2 x)' =$$

$$43. ((3-x)\sqrt{x})' =$$

$$44. \left(\frac{x^2}{1-x}\right)' =$$

$$45. \left(\left(\frac{1+x}{1-x}\right)^4\right)' =$$

$$46. \left(\frac{x-2}{\sqrt{x^2+1}}\right)' =$$

$$47. \left(\frac{x^2}{x^2+1}\right)' =$$

$$48. \left(\frac{\ln^2 x}{x}\right)' =$$

$$49. \left(\frac{\ln x}{\sqrt{x}}\right)' =$$



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$$50. \left(xe^{\frac{1}{x}}\right)' =$$

$$51. \left((x^2 + 1) \operatorname{atan}(x)\right)' =$$

$$52. \left(\ln(\operatorname{atan}(x^2))\right)' =$$

$$53. \left(\ln(\sin(2x))\right)' =$$

$$54. \left(\operatorname{atan} \sqrt{x^2 + 1}\right)' =$$

$$55. \left(\arcsin(x) + \frac{\sqrt{1-x^2}}{x+1}\right)' =$$

$$56. \left(\sqrt{\frac{1-x}{3+x^2}}\right)' =$$

$$57. \left(\arcsin \sqrt{\frac{x-1}{x}}\right)' =$$