

# Inverse functions and nonlinear equations

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Look at three or four or twenty  
my quizzes and then fill in my  
please!





If the function  $y = f(x)$  is one-to-one, then the inverse function  $f^{-1}$  exists and  $x = f^{-1}(y)$ . Hence the inverse function can be used to solve the relation  $y = f(x)$  with respect to  $x$ .

**Quiz** Solve the equations. Follow the pattern on the left and complete the right hand side of the equation.

1.

$$9 - \ln(3x - 1) = 0$$

$$\ln(3x - 1) =$$

$$3x - 1 =$$

$$3x =$$

$$x =$$

2.

$$e^{x-1} - 4 = 0$$

$$e^{x-1} =$$

$$x - 1 =$$

$$x =$$

3.

$$9 - \sqrt{e^x - 1} = 0$$

$$\sqrt{e^x - 1} =$$

$$e^x - 1 =$$

$$e^x =$$

$$x =$$

4.

$$3 \sin(x - 1) + 1 = 0$$

$$\sin(x - 1) =$$

$$x - 1 =$$

$$x =$$

5.

$$2e^{2x-1} - 1 = 0$$

$$e^{2x-1} =$$

$$2x - 1 =$$

$$x =$$



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Inverse functions

file inverzni-funkce.tex

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6.

$$2 + 3 \ln(7 - x) = 0$$

$$\ln(7 - x) =$$

$$7 - x =$$

$$x =$$

**Quiz** Complete the statements.

1. If  $y = \sin x$ , then  $x =$

2. If  $y = \arccos x$ , then  $x =$

3. If  $x = 1 + \ln y$ , then  $y =$

4. If  $\operatorname{atan}(2x + 1) = y$ , then  $x =$

5. If  $x - 4 = 2e^y$ , then  $y =$

6. If  $x^2 + 1 = \ln y$ , then  $y =$

7. If  $x - 1 = \arcsin(1 + y)$ , then  $1 + y =$   
and hence  $y =$





8. If  $e^x = 4$ , then  $x =$

9. If  $\ln(x + 2) = 3$ , then  $x =$

10. If  $\tan(x - 4) = 1 + y$ , then  $x =$

11. If  $e^{x+6} = \frac{1}{2}$ , then  $x =$

12. If  $4 + \ln x = 2$ , then  $x =$

13. If  $6 \ln(y + 3) = x^3$ , then  $y =$

14. If  $1 + a \tan \sqrt{y} = x$ , then  $y =$

15. If  $\ln \frac{y}{y+1} = x + 2$ , then  $\frac{y}{y+1} =$   
and hence  $y =$

16. If  $e^{\sqrt{1-y}} = 2x$ , then  $\sqrt{1-y} =$   
and hence  $y =$

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