

MTH 111 Practice for Exam II Answers

1. 25

2. $x = -\sqrt{5}, x = \sqrt{5}$

3. $(-2, 8)$

4. $(x - 3)/2$

5. $x^{4.75}$

6. $Q = e^{2P}$

7. 9.2

8. $\ln(x^{9/2})$

9. $\frac{1+\sqrt{73}}{18}$

10. $\frac{\ln 3}{\ln 2 - \ln 3}$

11. $f(x) = \frac{3x}{x+2}$

12. a) $(-\infty, 3) \cup [4, \infty)$ b) $[-2, -1] \cup [2, \infty)$

13.

14. Solve for x in $y = 2/(x + 1) : yx + y = 2 \implies x = (2 - y)/y$ so $f^{-1}(x) = (2 - x)/x$

15. Quotient is $x^2 + 4$, remainder is 2.

16. a) The common denominator is $x^2 - y^2$. Combining terms gives

$$\frac{x^3 + xy + x^3 - x^2y - y^3}{x^2 - y^2}$$

b) One way to simplify this is to multiply the numerator and denominator by ab^2 , which will clear all fractions in the numerator and denominator

$$\frac{a^2b - b^3}{a^3b^2 - a}$$

17. No. Then inverse of the function $f(x) = e^{3x}$ is the function

$$h(x) = \frac{\ln x}{3}.$$

Check:

$$f(h(x)) = e^{3(\frac{\ln x}{3})} = e^{\ln x} = x$$

and

$$h(f(x)) = \frac{\ln(e^{3x})}{3} = \ln(e^x) = x$$

