

Sample Problems for Exam 2

- Exam 2 will be held in class on Monday Nov 4.
 - Syllabus for Exam 2: 2.6, 2.7, Modeling with Functions (pp.213–222), 4.1, 4.2, 4.3, 4.4, 4.5, 4.6
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1. Review the past exam from Nov. 10, 2010 available online.
 2. If $f(x) = x^2 + 1$ and $g(x) = x - 3$, find the following (if impossible, write “DNE”).
(a) $f \circ g$ (b) $g \circ f$ (c) $g(f(2))$ (d) $g \circ g \circ g$ (e) $g^{-1}(x)$ (f) $f^{-1}(x)$
 3. Do Problems 9–10 in the Chapter 2 Test in your textbook (p.211)
 4. Find the inverse of $f(x) = \sqrt{3 - 5x}$. $f^{-1}(x) =$ _____
 5. Find the inverse of $f(x) = e^{3x}$. $f^{-1}(x) =$ _____
 6. Evaluate the following expressions.
(a) $\log_6 4 + \log_6 9$ (b) $\log_3 \sqrt{27}$ (c) $\log_{\sqrt{3}} 27$ (d) $\ln \frac{1}{\sqrt{e}}$
 7. If $\ln a = 3$, $\ln b = 4$, $\ln c = -5$, evaluate the following expressions.
(a) $\ln \frac{a^3}{b^2}$ (b) $\ln \sqrt{abc}$ (c) $\ln (be)$
 8. Combine into a single logarithm: $\ln x - 3 \ln(x^2 + 1) + \frac{1}{2} \ln(x + 5)$
 9. Solve the following equations.
(a) $3^{4x+5} = 9$
(b) $3^{x+2} = 4^{3x}$
(c) $\log_3(5 + 2x) = 2$
(d) $3 \ln(5 - x) = 4$
 10. Suppose \$7,000 is invested in a savings account paying 3.5% interest per year (APR).
(a) Find the amount in the account after 12 years if interest is compounded monthly.
(b) How long will it take for the account to have \$10,000 if interest is compounded semiannually?
(c) Find the amount in the account after 12 years if interest is compounded continuously.
(d) How long will it take for the account to have \$10,000 if interest is compounded continuously?
 11. Do Exercises 10, 14, 22, 23 in Section 4.6 (p.351)
 12. Do Problems 7–9 in the Chapter 4 Test in your textbook (p.356)