

Practice Problems - Lectures 21-22

Instructions: Get in a group of 3-4 students and complete the following problems. Turn in one set of solutions at the end of the class period with the names of all group members. Your work will be graded out of 5 points and will count as participation assignment 7. All group members will receive the same grade.

Problem 1. Solve the following exponential equations:

(a) $2^{6-3x} = 8^{x+1}$; (b) $\left(\frac{2}{3}\right)^x = \frac{9}{4}$.

Problem 2. Solve the following logarithmic equations by converting them to exponential form:

(a) $\log_2 x = 4$; (b) $\log_x \frac{27}{64} = 3$.

Problem 3. Rewrite the following expressions (assume all variables represent positive real numbers):

- (a) Expand and simplify as much as possible: $\log_5 \sqrt{\frac{5r^3}{z^5}}$;
(b) Write as a single logarithm with coefficient 1: $5 \log_3(z + 7) + \log_3(2z + 9)$.

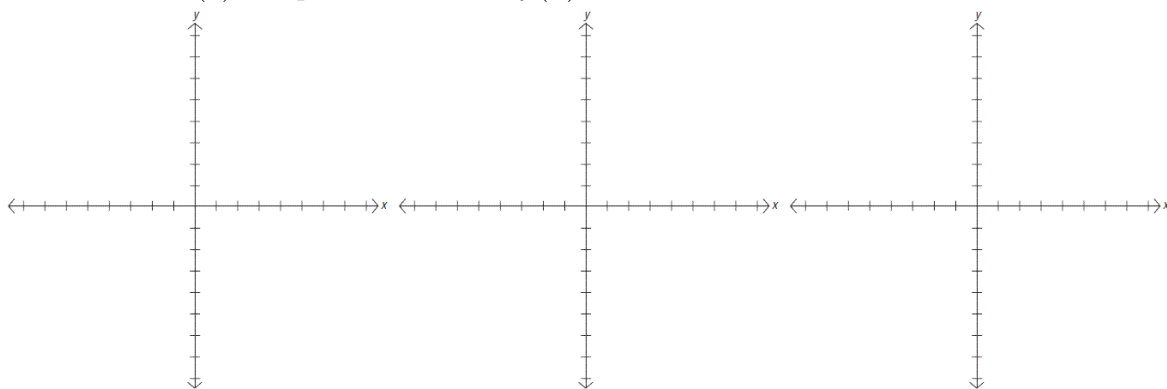
Problem 4. Your grandmother leaves you an inheritance of \$5,000. You place the money in an account earning 5% interest compounded quarterly.

(a) How much money will you have after 5 years (assuming you make no withdrawals)?

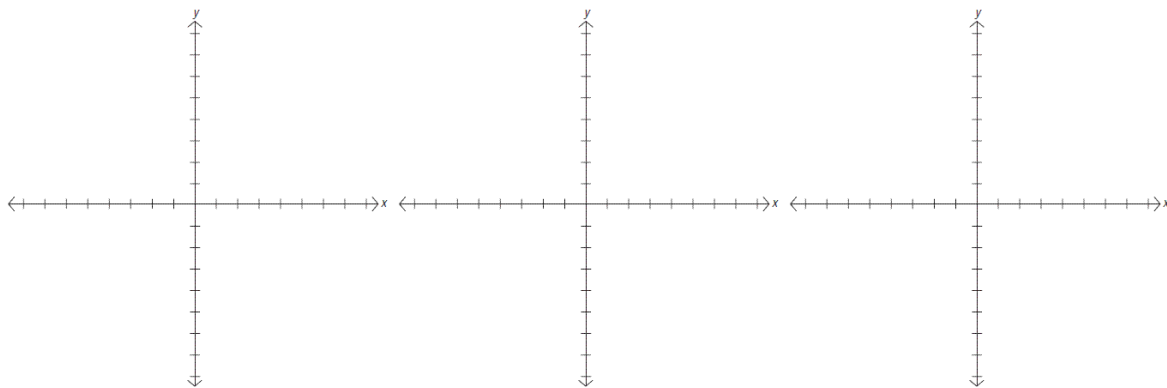
(b) If the interest is compounded continuously instead of quarterly, how much money will you have after the same amount of time (5 years)?

*You may use a calculator to complete this problem.

Problem 5. (a) Graph the function $f(x) = 2^{x+1} + 2$:



(b) Graph the function $g(x) = \log_2(x - 2) - 1$:



Answers:

1. (a) $x = \frac{1}{2}$; (b) $x = -2$.

2. (a) $x = 16$; (b) $x = \frac{3}{4}$.

3. (a) $\frac{1}{2}(1 + 3\log_5 r - 5\log_5 z)$;
(b) $\log_3[(z + 7)^5(2z + 9)]$.

4. (a) \$6,410.19; (b) \$6,420.13.