

Below is a selection of problems related to section 1.2. These problems will not be collected or graded. However, you should understand how to work each of these problems. If you have questions, please ask your TA or instructor. If you find a problem difficult, consider working similar problems from the text for additional practice.

1. Work the following problems from Stewart: §1.2, #3, 5, 7, 13, 15, 23, 33, 35, 45, 47, 48, 51.
2. Let $f(x) = x^2$,
 - (a) Find a formula for $f \circ f$.
 - (b) Find a formula for $f \circ f \circ f$.
 - (c) Find a formula for $f \circ f \circ f \circ f \circ f$.
 - (d) Guess a formula for the n -fold composition

$$f \circ f \circ \dots \circ f.$$

Here, the function f appears n times.

3. If $f(x) = x^2 + 2x$ and $g(x) = -1 + \sqrt{x}$.
 - (a) What is the domain of g ?
 - (b) What is the range of f ?
 - (c) Find $f \circ g$.
 - (d) Find $g \circ f$. Be careful, the answer is not x ! For which x is this function defined?
4. Are there any functions which are both even and odd?
5. A function is periodic with period p if $f(x + p) = f(x)$.
 - (a) Give examples of functions which are periodic with period 2π .
 - (b) Give examples of functions which are periodic with period 1.
 - (c) If f is periodic with period p , is $f(x + 10)$ periodic? What is the period.
 - (d) If f is periodic with period 1, is $f(2x)$ periodic? What is the period?