

## MATHEMATICS 201-BNJ-05

Topics in Mathematics

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# Maple Exercises

1. Write a procedure that given a number  $x$ , will square that number.
2. Write a procedure that given a number  $x$ , will give the message “Undefined” if  $x$  is negative, and will give the square root if it is nonnegative.
3. Write a procedure that given a positive integer  $n$ , will return either “prime” if the number is prime, or “composite” if it is not prime.
4. Write a procedure that given a positive integer  $n$ , will return either “single digit” if the number is between 0 and 9, “double digit” if between 10 and 99, “triple digit” if the number is between 100 and 999, and “more than three digits” if the number is 1000 or bigger.
5. Write a procedure that given a positive integer  $n$ , will add the even numbers from 2 to  $2n$ .
6. Write a procedure that will give the  $n^{\text{th}}$  term of the dynamical system  $a_{n+1} = \frac{1}{4}a_n + 5$ ,  $a_1 = 3$ .
7. Write a procedure that will list the first  $n$  terms of the dynamical system  $a_{n+1} = \frac{1}{4}a_n + 5$ ,  $a_1 = 3$ .
8. Write a procedure that will add the first  $n$  terms of the dynamical system  $a_{n+1} = \frac{1}{4}a_n + 5$ ,  $a_1 = 3$ .
9. Write a procedure that gives the  $n^{\text{th}}$  term of the dynamical system  $b_{n+2} = b_n b_{n+1}$ ,  $b_1 = 2$ ,  $b_2 = 3$ .
10. Write a procedure that will list the first  $n$  terms of the dynamical system  $b_{n+2} = b_n b_{n+1}$ ,  $b_1 = 2$ ,  $b_2 = 3$ .
11. Write a procedure that adds the first  $n$  terms of the dynamical system  $b_{n+2} = b_n b_{n+1}$ ,  $b_1 = 2$ ,  $b_2 = 3$ .

For all of the above questions, try your procedure with a few values to make sure that it works!

12. Try some of the cobweb diagrams from the examples we did in class or from the book!