Writing Functions and Modules Review

Write programs that accomplish each task. Use appropriate variable names and prompts for user input when necessary. Include a header for each *program* and for each *function*. Ensure that all values input by the user are within acceptable ranges, using functions to perform input validation. You may assume that all values will be the correct *type*.

1. Write a function, `get_even_integer`, that reads an even integer from the user. In your main program, have the user enter two even values, then find their sum.

2. Write a function, `yes_or_no`, that prompts the user to enter “yes” or “no” (or case variants like “YES” or “No”) and returns one of these two values. Allow the prompt to be customized, depending on the scenario. Include a default value for the prompt.

3. Write a module, `dnd_dice`, that contains a function that rolls an *n*-sided die an arbitrary number of times and returns the sum of the rolls, for use with *Dungeons and Dragons*™ RPGs. Then, write specific functions for a 4-sided (d4), 6-sided (d6), 8-sided (d8), 10-sided (d10), 12-sided (d12) and 20-sided (d20) die. Note that you should be able to call your generic function, rather than rewriting each new one from scratch. Import your module into your main program and use it to generate some rolls.

4. Write a module, `quadratics`, that will help you with some of your mathematics homework. Your module should contain the functions below. All functions operate on the standard form of a quadratic, $y=ax^2+bx+c$, where a, b, and c are real numbers and $a \neq 0$. Your main program should read the values of a, b and c from the user, then work with those values.

   - `find_roots`: determine the real roots (zeroes) of a quadratic function, if they exist.
   - `find_vertex`: determine the coordinates, (h, k), of the vertex of the function’s parabola.
   - `factored_form`: convert an equation from standard form to factored form, if possible.
   - `vertex_form`: convert an equation from standard form to vertex form, either by completing the square or some other process.