

## SHEET 2

- (Table) Using the techniques of this chapter, write a program that calculates the squares and cubes of the integers from 0 to 5. Use tabs to print the following neatly formatted table of values:

Integer	square	cube
-----	-----	-----
0	0	0
1	1	1
2	4	8
3	9	27
4	16	24
5	25	125

- (Digits of an Integer) Write a program that inputs a five-digit integer, separates the integer into its digits and prints them separated by three spaces each. [Hint: Use the integer division and modulus operators. For example, if the user types in 42339, the program should print:  
4      2      3      3      9
- (Diameter, Circumference and Area of a Circle) Write a program that reads in the radius of a circle as an integer and prints the circle's diameter, circumference and area. Use the constant value 3.14159 for  $\pi$ . Do all calculations in output statements.
- (Arithmetic) Write a program that asks the user to enter two numbers, obtains the two numbers from the user and prints the sum, product, difference, and quotient of the two numbers.
- (Numerical) a. Design, write, compile, and run a C++ program to calculate the sum of the integers from 1 to 100. This is the formula for calculating this sum:
  - sum =  $(n/2) (2 \cdot a + (n - 1)d)$ 
    - n is the number of integers to be added.
    - a is the first number.
    - d is the difference between each number.
  - b. Manually check the values computed by your program. After verifying that your program is working correctly, modify it to determine the sum of the integers from 100 to 1000.

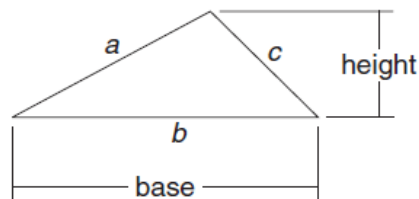
SHEET 2

- (Physics) a. Design, write, compile, and run a C++ program to calculate the elapsed time it takes to make a 183.67-mile trip. This is the formula for computing elapsed time:
  - elapsed time = total distance / average speed
  - The average speed during the trip is 58 mph.
- b. Manually check the values computed by your program. After verifying that your program is working correctly, modify it to determine the elapsed time it takes to make a 372-mile trip at an average speed of 67 mph.



1. (General math) a. Design, write, compile, and run a C++ program that calculates and displays the area of a triangle, such as the one in Figure 2.18, with a base of 1 in and a height of 1.5 in. The area is given by this formula:

$$\text{Area} = \frac{1}{2} (\text{base}) \times (\text{height})$$



**Figure 2.18** A two-dimensional triangle

- b. Manually check the values computed by your program. After verifying that your program is working correctly, modify it to determine the area of a two-dimensional triangle with a base of 3.5 in and a height of 1.45 in.

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What is wrong with the following program? How would you correct it?

```
#include <iostream>
using namespace std;

int main()
{
    number = 62.7;
    double number;
    cout << number << endl;
    return 0;
}
```