AP Computer Science Name: _____
Chapter 2 Programs

1. Create a program called `Cylinder`. This program should ask the user to input a radius and a height of any size, then output the surface area and volume. Create a constant called `PI` for this program, it may be a field or local variable.

2. Create a program called `GradeCalculator`, which prompts the user to input 5 test scores out of 100 points. The program then should output their grade average rounded to the nearest tenth of a percent. (For an extra challenge, try to see if you can also output the letter grade.)

3. Create a program that takes an integer value between `0` and `1000` from the user and adds all the digits in the integer. For example, if an integer is `932`, the sum of all its digits is `14`.

Hint: Use the `%` operator to extract digits, and use the `/` operator to remove the extracted digit. For instance, `932 % 10 = 2` and `932 / 10 = 93`.

4. Write a program that prompts the user to enter the minutes (e.g., 1 billion) and displays the number of years and days and remaining minutes for the minutes. For simplicity, assume a year has 365 days.

5. The equation $A = P\left(1 + \frac{r}{n}\right)^{nt}$ represents an equation for compound interest, where P represents your principal or starting value, r your nominal interest rate in decimal form, n the number of times the interest is compounded, and t represents time in years. Write a program that prompts the user to enter in the required information to calculate the future value of an investment. It should round the answer to the nearest penny.

6. Write a program that prompts the user to enter two points $(x1, y1)$ and $(x2, y2)$ and displays their distances. The formula for computing the distance $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$. Note you can use `Math.pow(a, 0.5)` to compute $\sqrt{a}$. Your main method should be in a class of its own.

7. Using the class from #6, write a program that prompts the user to enter three points $(x1, y1)$, $(x2, y2)$, $(x3, y3)$ of a triangle and displays its area. The formula for computing the area of a triangle is

$$s = (side1 + side2 + side3) / 2$$
$$area = \sqrt{s(s - side1)(s - side2)(s - side3)}$$