Practical 3

1. Write a C++ program that asks the user to enter the **number of days** and then converts that value to weeks and days. For example:

```
Enter the number of days : 19
19 days = 2 weeks, 5 days.
```

2. Write a C++ program that reads a **4-digit integer**. The program then extracts each of the individual digits and displays them on the screen respectively. For example:

```
Enter a 4-digit integer :  5832

1st digit : 5
2nd digit : 8
3rd digit : 3
4th digit : 2
```

3. The formula for converting Centigrade (C) temperatures to Fahrenheit (F) is:

$$F = 32 + \left(C \times \frac{180.0}{100.0} \right)$$

Write a C++ program that asks the user to enter a temperature reading in Centigrade and then output the equivalent Fahrenheit value. Be sure to include at least one negative centigrade number in your test cases.

4. Write a C++ program that reads a **4-digit integer**. The program then displays the integer as a sum of its thousands, hundreds, tens and ones. For example:

```
Enter a 4-digit integer : 5832

5000 + 800 + 30 + 2
```

5. Write a C++ program that prompts the user to input the **length** and **height** of a triangle (in cm) and calculate the **area** of the **triangle**. Sample output is shown below:

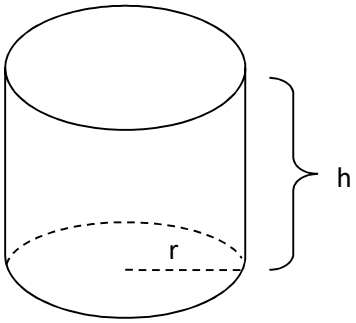
```
Enter the height of the triangle : 6
Enter the length of the triangle : 5

Area of triangle
---------------------------
Height :          6 cm
Length :          5 cm
Area   :         15 cm
```

6. Write a C++ program to calculate the cost of producing a number of open-top cylindrical containers. The surface area of a container is the sum of the area of the circular base plus the area of the outside (the circumference of the base times the height of the container). Your program has to take the **radius** (in cm) of the base, the **height** (in cm) of the container, the **cost** of the material used in making the container (in RM/cm^2), and the amount of containers in order to calculate the total cost. Take **π** as **3.142**. Below is the formula for calculating the surface area of the cylindrical container:

Total surface area = area of the base + area of the outside
= $\pi r^2 + 2\pi rh$

where r = radius, h = height of the cylinder



Sample output is shown below:

```
Please enter the radius of the cylinder (in cm) : 3.5
Please enter the height of the cylinder (in cm) : 12.8
Please enter the cost of the material (in RM/cm²): 0.33
Please enter the amount of cylinder : 9

The total cost for producing 9 containers with 3.50 cm radius
and 12.80 cm height is RM 950.44.
```

7. Trace the programs below. What will be the output produced on the screen?

(a)

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

int main()
{
	int a, b = 7, c = 3;

	a = ++b - ++c;
	cout << "a = " << a << ", b = " << b << ", c = " << c << endl;

	a = b-- - --c;
	cout << "a = " << a << ", b = " << b << ", c = " << c << endl;

	a = b++ + c--;
	cout << "a = " << ++a << ", b = " << ++b << ", c = " << c-- << endl;

	return 0;
}
```

(b)

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

int main()
{
	int a=6, b=4, c=5, d=9;

	a = ++b - --d / c--;
	cout << "a = " << a << ", b = " << b << ", c = " << c
		<< ", d = " << d << endl;

	d += ++a - (b % --c);
	cout << "a = " << a << ", b = " << b << ", c = " << c
		<< ", d = " << d << endl;

	c -= a++ * --b;
	cout << "a = " << a << ", b = " << ++b << ", c = " << c--
		<< ", d = " << d << endl;

	return 0;
}
```