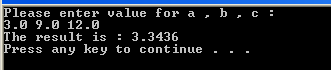
**Practica1 7 answers**

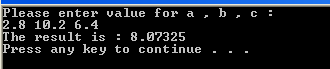
1. With reference to the following equation:



Write a function to determine *x* based on the input from user of the *a, b* and *c* values. You should use the predefined maths function provided by C++.

**Sample output:**

****

****

**Answer:**

#include <iostream>

#include <cmath>

using namespace std;

double square(double a, double b, double c, double &result);

int main()

{

double a, b, c, result;

cout << "Please enter value for a , b , c : \n";

cin >> a >> b >> c;

square(a, b, c, result);

cout << "The result is : " << result << endl;

system("pause");

return 0;

}

double square(double a, double b, double c, double &result)

{

double r1;

r1 = b \* sqrt(pow(b, 2.0) - (1 / 2.0\*a));

return result = r1 / (2 \* c);

}

1. Write a program that is able to triple the value that user entered in the main function. The operation of tripling the value shall be done:
2. In a function int triple (int x) in which this function shall perform the operation and return the value.

**Answer:**

#include <cmath>

#include <iostream>

using namespace std;

int triple (int x);

int main ()

{

int x , result;

cout << "Please enter the a value : \n";

cin >> x;

result = triple (x);

cout << "The result is : \n" << result << endl;

system("pause");

return 0;

}

int triple (int x)

{

return (x \* 3);

}

1. In a function void triple (int x, int &result). In which this function shall perform the operation and no value needs to be returned as the result is pass by reference.

**Answer:**

#include <iostream>

#include <cmath>

using namespace std;

void triple (int x, int &result);

int main ()

{

int x , result;

cout << "Please enter the a value : \n";

cin >> x;

triple (x, result);

cout << "The result is : \n" << result << endl;

system("pause");

return 0;

}

void triple (int x, int &result)

{

result = (x \* 3);

}

1. With reference to the above functions, explain the main difference between pass by value and pass by reference.

**Answer:**

**In the above example result is passed as a reference to the function triple. Whenever there is a change in the parameter in function, it would change the original value in the argument. This is because a reference is passed to the function that would represent that the parameter variable is an alias to the argument variable.**

1. Write a program that calculates the sum of the digits in an integer. Implement your function using the following signature:

int SumD (int n)

For example SumD(123) will yield the return result of 1+2+3 = 6. Implement a

full program that would prompt the user the value of n and display the result

accordingly.

**Answer:**

#include <iostream>

#include <cmath>

using namespace std;

int SumD (int n);

int main ()

{

int n , result;

cout << "Please enter the a value : \n";

cin >> n;

result = SumD(n);

cout << "The result is : \n" << result << endl;

system("pause");

return 0;

}

int SumD (int n)

{

int total = 0, rem =0 , bal = 0;

bal = n;

while (bal != 0)

{

rem = bal % 10;

total = total + rem;

bal = bal / 10;

}

return total;

}

1. Write a program that will prompt a user whether he/she wants to calculate area for circle, triangle and rectangle. Write three functions following the type of polygon chosen. Once the selection is made, the program then will invoke the relevant function. In the respective function, the user shall be prompted with the necessary input of variables like radius, width, length, base or height.

**Answer:**

#include <iostream>

using namespace std;

void circle();

void triangle();

void rectangle();

int main()

{

char choice;

cout << "Area for circle (press c) \n";

cout << "Area for triangle (press t) \n";

cout << "Area for rectangle (press r) \n";

cout << "Please make your choice (c,t or r) : ";

cin >> choice;

if (choice == 'c' || choice == 'C')

circle();

else if (choice == 't' || choice =='T')

triangle();

else if (choice == 'r' || choice == 'R')

rectangle();

else

cout << "Wrong choice has been entered \n";

system ("pause");

return 0;

}

void circle()

{

int radius;

double area;

cout << "Please enter radius for area calculation : \n";

cin >> radius;

area = 3.142 \* (radius \* radius );

cout << "The area of the circle : " << area << endl;

}

void triangle()

{

int base , height;

double area;

cout << "Please enter value for base : \n";

cin >> base;

cout << "Please enter value for height : \n";

cin >> height;

area = 0.5 \* (base \* height);

cout << "Area of the triangle : " << area << endl;

}

void rectangle()

{

int length, width;

cout << "Please enter value for length : ";

cin >> length;

cout << "Please enter value for width : ";

cin >> width;

cout << "Area of rectangle is : " << length \* width << endl;

}

1. Write a program that is able to evaluate simple mathematical operations like

*addition (+), subtraction (-), division (/) and multiplication (\*).*

User of the program only needs to input two numbers and the operation that the user

wants to execute. The program will then generate the result of the operation for the

two numbers. The program needs to be implemented using four (4) funtions

*(add, subtract, multiply and divide)*

Following is the intended outcome of the program:

**Please enter your selection of operations:**

**1) Addition (press 1)**

**2) Subtraction (press 2)**

**3) Multiplication (press 3)**

**4) Division (press 4)**

**Your choice: 1**

**Type in your expression:**

**23 + 27**

**Result is 50**

If there is operation that involved Division by zero, the system would notify the user

with the following message *“Division by zero”*. All the functions are needed to accept two arguments as entered by the user for the necessary operation. The functions need to return the result of the operation. The program needs display result of the operation.

**Answer:**

#include <iostream>

using namespace std;

double add (int,int);

double subtract (int, int);

double multiply (int, int);

double divide (int, int);

int main ()

{

char choice, opr;

int n1, n2;

double result = 0.0;

cout << "1) Addition (press 1) \n";

cout << "2) Subtraction (press 2) \n";

cout << "3) Multiplication (press 3) \n";

cout << "4) Division (press 4) \n";

cout << "Your choice : ";

cin >> choice;

cout << "Type in your choice: \n";

cin >> n1 >> opr >> n2;

if (choice == '1')

result = add(n1, n2);

else if (choice == '2')

result = subtract(n1, n2);

else if (choice == '3')

result = multiply (n1,n2);

else if (choice == '4')

{

if (n2 == 0)

cout << "Division by zero \n";

else

result = divide (n1,n2);

}

else

cout << "Wrong choice has been entered \n";

if (n2 == 0)

cout << "No result \n";

else

cout << "Result is " << result << endl;

system ("pause");

return 0;

}

double add( int x , int y)

{

double result;

result = x + y;

return result;

}

double subtract (int x , int y)

{

double result;

result = x - y;

return result;

}

double multiply (int x , int y)

{

double result;

result = x \* y;

return result;

}

double divide (int x , int y)

{

double result;

result = x / static\_cast <double> (y);

return result;

}