```cpp
#include<iostream>
#include <stdlib.h>
#include <random>
#include <math.h>
#define PI 3.14
using namespace std;

int option = 0; // global variable
int updateScore = 0;

void gradeOneChoice();
void gradeTwoChoice();
void gradeThreeChoice();
void gradeFourChoice();
void gradeFiveChoice();
void gradeSixChoice();
void gradeLevel();
void title();


int main(){
    srand((unsigned) time(NULL));
    gradeLevel();
    return 0;
}


void catcher(){
    cin.clear(); //clear the input cin
    cin.ignore(100, '\n'); //Up to 100 characters ignored
}

void spacer(){ // for spacing only not clearing
    int clear = 100;
    do {
        cout << endl;
        clear -= 1;
    } while (clear !=0);
}

void tryAgain(){
    char tryAgain;
    option = 0;
```

```cpp
    cout << "WOULD YOU LIKE TO SOME MORE QUESTIONS? "<< endl;
    cout << "[ENTER Y if YES] / [ENTER ANYTHING if NO]: ";
    cin >> tryAgain;

    if (tryAgain == 'Y' || tryAgain == 'y'){
        spacer();
        gradeLevel();
    } else {
        cout << "                          THANK YOU FOR USING  " << endl;
        title();
        exit(0);
    }

}

void title(){ // just some element
    cout << "█████  ████  ██████  ██  ██████ ██████████  ████  ██ ██
████     ████████   ██ █             " <<endl;
    cout << "██   ██   ██  ████   ██ ██  ██  █  ████ ██████ ██
██  █  █            " <<endl;
    cout << "██  █ ██ ██  ██ ██ ██ █ ████  ██ ████  ████ ██ ████
█████ █  ██  ████          " <<endl;
    cout << "██████ ██ █  ██ ██ ██ ████ ██  █ ██ ██ ██ ██ ██
██  █  █            " <<endl;
    cout << "  ██   ██ ██ ████████ ██ ████████ ██████████ ████ ██
██  █  █  █  █            " <<endl;
}

void gradeLevel(){ // to show
    title();
    option = 0;

    cout << " " << endl;
    cout << "                      CHOOSE WHAT GRADE LEVEL ARE YOU                   " << endl;
    cout << " " << endl;
    cout << "
+========================================================================
===============+" << endl;
    cout << " |  PRESS  |  LEVEL  |  DESCRIPTION                                |" << endl;
    cout << " +-----------+-----------------------------------------------------------------------+" << endl;
    cout << " |  [ 1 ]  |  GRADE 1  |  TO ADD AND SUBTRACT NUMBERS UP TO 100
|" << endl;
    cout << " +-----------+-----------------------------------------------------------------------+" << endl;
```

```cpp
    cout << " |   [ 2 ]   |  GRADE 2  |  TO ADD SUBTRACT NUMBERS UP TO 1000               |" << endl;
    cout << " |          |          |  MULTIPLY AND DIVIDE ONE(1) DIGIT NUMBERS                      |" << endl;
    cout << " +-----------+--------------------------------------------------------------------------+" << endl;
    cout << " |   [ 3 ]   |  GRADE 3  |  TO ADD SUBTRACT NUMBERS UP TO 10000              |" << endl;
    cout << " |          |          |  MULTIPLY AND DIVIDE TWO(2) DIGIT NUMBERS                      |" << endl;
    cout << " +-----------+--------------------------------------------------------------------------+" << endl;
    cout << " |   [ 4 ]   |  GRADE 4  |  TO ADD SUBTRACT NUMBERS UP TO 100000             |" << endl;
    cout << " |          |          |  MULTIPLY AND DIVIDE THREE(3) DIGIT NUMBERS                    |" << endl;
    cout << " +-----------+--------------------------------------------------------------------------+" << endl;
    cout << " |   [ 5 ]   |  GRADE 5  |  TO ADD SUBTRACT DECIMAL NUMBERS UP TO 100.00    |" << endl;
    cout << " |          |          |  MULTIPLY AND DIVIDE TWO(2) DIGIT DECIMAL NUMBERS |" << endl;
    cout << " +-----------+--------------------------------------------------------------------------+" << endl;
    cout << " |   [ 6 ]   |  GRADE 6  |  TO SOLVE FOR AREA AND PERIMETER OF SOME BASIC
SHAPES          |" << endl;
    cout << " +-----------+--------------------------------------------------------------------------+" << endl;
    cout << " |   [ 7 ]   |  EXIT    |  TO EXIT THE PROGRAM                            |" << endl;
    cout << "
+=======================================================================
===============+" << endl;

    cout << " " << endl;
    cout << "   ENTER THE NUMBER OF YOUR CHOICE: ";
    cin >> option;

    switch(option){
       case 1:
          gradeOneChoice();
          break;

       case 2:
          gradeTwoChoice();
          break;

       case 3:
          gradeThreeChoice();
          break;
```

```cpp
        case 4:
           gradeFourChoice();
           break;

        case 5:
           gradeFiveChoice();
           break;

        case 6:
           gradeSixChoice();
           break;


        case 7:
           spacer();
           cout << "                        THANK YOU FOR USING  " << endl;
           title();
           break;

        default:

           cout << " ======================================= " << endl;
           cout << "  [INVALID] INVALID INPUT PLEASE TRY AGAIN  " << flush;
           system("read");
           catcher();
           spacer();
           gradeLevel();
           break;
    }
}

void gradeOneChoice(){ // for grade 1 addition and subtraction numbers up to 50

    int addOne, addTwo, sum, answer ,subtra, minu, diff;

    cout << " ======================================= " << endl;
    cout << "     YOU HAVE CHOSEN GRADE 1 LEVEL     " << endl;
    cout << " ======================================= " << endl;
    cout << "     CHOOSE WHAT TYPE OF OPERATION     " << endl;
    cout << "           [1] ADDITION              " << endl;
    cout << "           [2] SUBTRACTION            " << endl;
    cout << "           [3] BACK TO MENU            " << endl;
```

```cpp
cout << "   ENTER THE NUMBER OF YOUR CHOICE: ";
cin >> option;

switch (option){
    case 1:
        cout << " ======================================= " << endl;
        cout << "      YOU HAVE CHOSEN ADDITION         " << endl;
        cout << " ======================================= " << endl;

        // to generate numbers
        for(int a = 1; a <= 10; a++) {

            // Retrieve a random number from 0 to 100
            addOne =  rand() % 100;
            addTwo =  rand() % 100;

            // Will get the answer
            sum = addOne + addTwo;

            cout << "   " << a << "). " << addOne << " + " << addTwo << " = ";
            cin >> answer;
            catcher();

            if (sum == answer){
                updateScore += 1;
            }
        }

        cout << " ======================================= " << endl;
        cout << "      YOUR SCORE IS: " << updateScore << endl;
        cout << " ======================================= " << endl;
        break;

    case 2:
        cout << " ======================================= " << endl;
        cout << "      YOU HAVE CHOSEN SUBTRACTION       " << endl;
        cout << " ======================================= " << endl;


        // to generate numbers
        for(int a = 1; a <= 10; a++) {

            // Retrieve a random number from 0 to 100
            subtra = rand() % 100;
```

```cpp
        minu = rand() % 100;

        // so that there will be no negative answer
        if (subtra > minu){
            diff = subtra - minu; // Will get the difference
            cout << "    " << a << "). " << subtra << " - " << minu << " = ";
            cin >> answer;
            catcher();


        } else {
            diff = minu - subtra; // Will get the difference
            cout << "    " << a << "). " << minu << " - " << subtra << " = ";
            cin >> answer;
            catcher();

        }

        if (diff == answer){
            updateScore += 1;
        }
    }
    cout << " ======================================= " << endl;
    cout << "       YOUR SCORE IS: " << updateScore << endl;
    cout << " ======================================= " << endl;
    break;

    case 3:
        option = 0;
        spacer();
        gradeLevel();
        break;
    }
    tryAgain();
}

void gradeTwoChoice() { // for grade 2 add,multiply, subtract, divide numbers up to 100
    int addOne, addTwo, sum, answer ,subtra, minu, diff;
    int mPlier, mPlicand, product;
    int diviDend, diviSor, qout, remain, remainAns;


    cout << " ======================================= " << endl;
    cout << "       YOU HAVE CHOSEN GRADE 2 LEVEL      " << endl;
```

```cpp
cout << " ======================================== " << endl;
cout << "     CHOOSE WHAT TYPE OF OPERATION      " << endl;
cout << "          [1] ADDITION             " << endl;
cout << "          [2] SUBTRACTION           " << endl;
cout << "          [3] MULTIPLICATION          " << endl;
cout << "          [4] DIVISION             " << endl;
cout << "          [5] BACK TO MENU          " << endl;


cout << "   ENTER THE NUMBER OF YOUR CHOICE: ";
cin >> option;

switch (option) {
   case 1:
      cout << " ======================================== " << endl;
      cout << "     YOU HAVE CHOSEN ADDITION         " << endl;
      cout << " ======================================== " << endl;

      // to generate numbers
      for (int a = 1; a <= 10; a++) {

         // Retrieve a random number from 0 to 1000
         addOne = rand() % 1000;
         addTwo = rand() % 1000;

         // Will get the answer
         sum = addOne + addTwo;

         cout << "   " << a << "). " << addOne << " + " << addTwo << " = ";
         cin >> answer;
         catcher();


         if (sum == answer) {
            updateScore += 1;
         }
      }

      cout << " ======================================== " << endl;
      cout << "     YOUR SCORE IS: " << updateScore << endl;
      cout << " ======================================== " << endl;
      break;

   case 2:
```

```cpp
    cout << " ======================================= " << endl;
    cout << "      YOU HAVE CHOSEN SUBTRACTION        " << endl;
    cout << " ======================================= " << endl;


    // to generate numbers
    for (int a = 1; a <= 10; a++) {

      // Retrieve a random number from 0 to 1000
      subtra = rand() % 1000;
      minu = rand() % 1000;

      // so that there will be no negative answer
      if (subtra > minu) {
        diff = subtra - minu; // Will get the difference
        cout << "    " << a << "). " << subtra << " - " << minu << " = ";
        cin >> answer;
        catcher();


      } else {
        diff = minu - subtra; // Will get the difference
        cout << "    " << a << "). " << minu << " - " << subtra << " = ";
        cin >> answer;
        catcher();

      }

      if (diff == answer) {
        updateScore += 1;
      }
    }
    cout << " ======================================= " << endl;
    cout << "      YOUR SCORE IS: " << updateScore << endl;
    cout << " ======================================= " << endl;
    break;

case 3:
    cout << " ======================================= " << endl;
    cout << "      YOU HAVE CHOSEN MULTIPLICATION        " << endl;
    cout << " ======================================= " << endl;

    // to generate numbers
    for (int a = 1; a <= 10; a++) {
```

```cpp
        // Retrieve a random number from 1 to 10
        mPlier = 1 + (rand() % 9);
        mPlicand = 1 + (rand() % 9);

        // Will get the answer
        product = mPlier * mPlicand;

        cout << "   " << a << "). " << mPlier << " X " << mPlicand << " = ";
        cin >> answer;
        catcher();


        if (product == answer) {
            updateScore += 1;
        }
    }

    cout << " ======================================== " << endl;
    cout << "       YOUR SCORE IS: " << updateScore << endl;
    cout << " ======================================== " << endl;
    break;

case 4:
    cout << " ======================================== " << endl;
    cout << "       YOU HAVE CHOSEN DIVISION          " << endl;
    cout << " ======================================== " << endl;
    cout << " INSTRUCTIONS:                    " << endl;
    cout << "    PLEASE ENTER THE WHOLE NUMBER QUOTIENT " << endl;
    cout << "    AND THE REMAINDER.               " << endl;
    cout << " ======================================== " << endl;

    for (int a = 1; a <= 10; a++) {

        // Retrieve a random number from 1 to 10
        diviDend = 1 + (rand() % 9);
        diviSor = 1 + (rand() % 9);

        qout = diviDend / diviSor;
        remain = diviDend % diviSor;

        cout << "   " << a << "). " << diviDend << " / " << diviSor << ":" << endl;
        cout << "   ENTER QUOTIENT: ";
        cin >> answer;
```

```cpp
            catcher();


            cout << "   ENTER REMAINDER: ";
            cin >> remainAns;

            if (qout == answer && remainAns == remain) {
               updateScore += 1;
            }
         }

         cout << " ======================================= " << endl;
         cout << "      YOUR SCORE IS: " << updateScore << endl;
         cout << " ======================================= " << endl;
         break;


      case 5:
         option = 0;
         spacer();
         gradeLevel();
         break;
   }
   tryAgain();
}

void gradeThreeChoice(){ // for grade 1 addition and subtraction numbers up to 50

   int addOne, addTwo, sum, answer ,subtra, minu, diff;
   int mPlier, mPlicand, product;
   int diviDend, diviSor, qout, remain, remainAns;

   cout << " ======================================= " << endl;
   cout << "      YOU HAVE CHOSEN GRADE 3 LEVEL      " << endl;
   cout << " ======================================= " << endl;
   cout << "      CHOOSE WHAT TYPE OF OPERATION      " << endl;
   cout << "            [1] ADDITION           " << endl;
   cout << "            [2] SUBTRACTION           " << endl;
   cout << "            [3] MULTIPLICATION          " << endl;
   cout << "            [4] DIVISION           " << endl;
   cout << "            [5] BACK TO MENU          " << endl;

   cout << "   ENTER THE NUMBER OF YOUR CHOICE: ";
   cin >> option;
```

```cpp
switch (option){
    case 1:
        cout << " ======================================== " << endl;
        cout << "      YOU HAVE CHOSEN ADDITION          " << endl;
        cout << " ======================================== " << endl;

        // to generate numbers
        for(int a = 1; a <= 10; a++) {

            // Retrieve a random number from 0 to 10 000
            addOne =  rand() % 10000;
            addTwo =  rand() % 10000;

            // Will get the answer
            sum = addOne + addTwo;

            cout << "   " << a << "). " << addOne << " + " << addTwo << " = ";
            cin >> answer;
            catcher();


            if (sum == answer){
                updateScore += 1;
            }
        }

        cout << " ======================================== " << endl;
        cout << "      YOUR SCORE IS: " << updateScore << endl;
        cout << " ======================================== " << endl;
        break;

    case 2:
        cout << " ======================================== " << endl;
        cout << "     YOU HAVE CHOSEN SUBTRACTION        " << endl;
        cout << " ======================================== " << endl;


        // to generate numbers
        for(int a = 1; a <= 10; a++) {

            // Retrieve a random number from 0 to 100
            subtra = rand() % 10000;
            minu = rand() % 10000;
```

```cpp
            // so that there will be no negative answer
            if (subtra > minu){
                diff = subtra - minu; // Will get the difference
                cout << "    " << a << "). " << subtra << " - " << minu << " = ";
                cin >> answer;
                catcher();


            } else {
                diff = minu - subtra; // Will get the difference
                cout << "    " << a << "). " << minu << " - " << subtra << " = ";
                cin >> answer;
                catcher();

            }

            if (diff == answer){
                updateScore += 1;
            }
        }
        cout << " ======================================== " << endl;
        cout << "      YOUR SCORE IS: " << updateScore << endl;
        cout << " ======================================== " << endl;
        break;

    case 3:
        cout << " ======================================== " << endl;
        cout << "      YOU HAVE CHOSEN MULTIPLICATION        " << endl;
        cout << " ======================================== " << endl;

        // to generate numbers
        for(int a = 1; a <= 10; a++) {

            // Retrieve a random number from 10 to 99
            mPlier = 10 + (rand() % 89);

            // Retrieve a random number from 10 to 99
            mPlicand =  10 + (rand() % 89);

            // Will get the answer
            product = mPlier * mPlicand;

            cout << "    " << a << "). " << mPlier << " X " << mPlicand << " = ";
```

```cpp
            cin >> answer;
            catcher();


            if (product == answer){
                updateScore += 1;
            }
        }

        cout << " ========================================= " << endl;
        cout << "     YOUR SCORE IS: " << updateScore << endl;
        cout << " ========================================= " << endl;
        break;

    case 4:
        cout << " ========================================= " << endl;
        cout << "     YOU HAVE CHOSEN DIVISION        " << endl;
        cout << " ========================================= " << endl;
        cout << "  INSTRUCTIONS:                   " << endl;
        cout << "    PLEASE ENTER THE WHOLE NUMBER QUOTIENT " << endl;
        cout << "    AND THE REMAINDER.              " << endl;
        cout << " ========================================= " << endl;

        for (int a = 1; a <= 10; a++) {

            // Retrieve a random number from 1 to 10
            diviDend = 10 + (rand() % 89);
            diviSor = 1 + (rand() % 9);

            qout = diviDend / diviSor;
            remain = diviDend % diviSor;


            cout << "   " << a << "). " << diviDend << " / " << diviSor << ":" << endl;
            cout << "   ENTER QUOTIENT: ";
            cin >> answer;
            catcher();


            cout << "   ENTER REMAINDER: ";
            cin >> remainAns;


            if (qout == answer && remainAns == remain) {
```

```cpp
                updateScore += 1;
            }
        }

        cout << " ======================================== " << endl;
        cout << "       YOUR SCORE IS: " << updateScore << endl;
        cout << " ======================================== " << endl;
        break;

    case 5:
        option = 0;
        spacer();
        gradeLevel();
        break;
    }
    tryAgain();
}

void gradeFourChoice(){ // for grade 2 add,multiply, subtract, divide numbers up to 100

    int addOne, addTwo, sum, answer ,subtra, minu, diff;
    int diviDend, diviSor, qout, remain, remainAns;
    int mPlier, mPlicand, product;

    cout << " ======================================== " << endl;
    cout << "       YOU HAVE CHOSEN GRADE 4 LEVEL      " << endl;
    cout << " ======================================== " << endl;
    cout << "       CHOOSE WHAT TYPE OF OPERATION      " << endl;
    cout << "           [1] ADDITION            " << endl;
    cout << "           [2] SUBTRACTION           " << endl;
    cout << "           [3] MULTIPLICATION          " << endl;
    cout << "           [4] DIVISION           " << endl;
    cout << "           [5] BACK TO MENU          " << endl;


    cout << "   ENTER THE NUMBER OF YOUR CHOICE: ";
    cin >> option;

    switch (option){
        case 1:
            cout << " ======================================== " << endl;
            cout << "       YOU HAVE CHOSEN ADDITION          " << endl;
            cout << " ======================================== " << endl;
```

```cpp
      // to generate numbers
      for(int a = 1; a <= 10; a++) {

        // Retrieve a random number from 0 to 10 000
        addOne =  rand() % 100000;
        addTwo =  rand() % 100000;

        // Will get the answer
        sum = addOne + addTwo;

        cout << "    " << a << "). " << addOne << " + " << addTwo << " = ";
        cin >> answer;
        catcher();


        if (sum == answer){
          updateScore += 1;
        }
      }

    cout << " ======================================== " << endl;
    cout << "      YOUR SCORE IS: " << updateScore << endl;
    cout << " ======================================== " << endl;
    break;

case 2:
    cout << " ======================================== " << endl;
    cout << "      YOU HAVE CHOSEN SUBTRACTION       " << endl;
    cout << " ======================================== " << endl;


    // to generate numbers
    for(int a = 1; a <= 10; a++) {

      // Retrieve a random number from 0 to 100
      subtra = rand() % 100000;
      minu = rand() % 100000;

      // so that there will be no negative answer
      if (subtra > minu){
        diff = subtra - minu; // Will get the difference
        cout << "    " << a << "). " << subtra << " - " << minu << " = ";
        cin >> answer;
        catcher();
```

```cpp
        } else {
            diff = minu - subtra; // Will get the difference
            cout << "    " << a << "). " << minu << " - " << subtra << " = ";
            cin >> answer;
            catcher();

        }

        if (diff == answer){
            updateScore += 1;
        }
    }
    cout << " ========================================== " << endl;
    cout << "      YOUR SCORE IS: " << updateScore << endl;
    cout << " ========================================== " << endl;
    break;

case 3:
    cout << " ========================================== " << endl;
    cout << "      YOU HAVE CHOSEN MULTIPLICATION        " << endl;
    cout << " ========================================== " << endl;

    // to generate numbers
    for(int a = 1; a <= 10; a++) {

        // Retrieve a random number from 100 to 999
        mPlier = 100 + (rand() % 989);

        // Retrieve a random number from 10 to 99
        mPlicand =  10 + (rand() % 89);

        // Will get the answer
        product = mPlier * mPlicand;

        cout << "    " << a << "). " << mPlier << " X " << mPlicand << " = ";
        cin >> answer;
        catcher();


        if (product == answer){
            updateScore += 1;
        }
```

```cpp
        }

        cout << " ======================================= " << endl;
        cout << "       YOUR SCORE IS: " << updateScore << endl;
        cout << " ======================================= " << endl;
        break;

    case 4:
        cout << " ======================================= " << endl;
        cout << "        YOU HAVE CHOSEN DIVISION          " << endl;
        cout << " ======================================= " << endl;
        cout << "  INSTRUCTIONS:                      " << endl;
        cout << "     PLEASE ENTER THE WHOLE NUMBER QUOTIENT " << endl;
        cout << "     AND THE REMAINDER.               " << endl;
        cout << " ======================================= " << endl;

        for (int a = 1; a <= 10; a++) {

            // Retrieve a random number from 1 to 10
            diviDend = 100 + (rand() % 989);
            diviSor = 10 + (rand() % 89);

            qout = diviDend / diviSor;
            remain = diviDend % diviSor;

            cout << "    " << a << "). " << diviDend << " / " << diviSor << ":" << endl;
            cout << "    ENTER QUOTIENT: ";
            cin >> answer;
            catcher();

            cout << "    ENTER REMAINDER: ";
            cin >> remainAns;


            if (qout == answer && remainAns == remain) {
                updateScore += 1;
            }
        }

        cout << " ======================================= " << endl;
        cout << "       YOUR SCORE IS: " << updateScore << endl;
        cout << " ======================================= " << endl;
        break;
```

```cpp
        case 5:
            option = 0;
            spacer();
            gradeLevel();
            break;
    }
    tryAgain();
}

void gradeFiveChoice(){ // for grade 2 add,multiply, subtract, divide numbers up to 100

    float addOne, addTwo, sum, answer ,subtra, minu, diff;
    float diviDend, diviSor, qout;
    float mPlier, mPlicand, product;

    cout << " ========================================= " << endl;
    cout << "      YOU HAVE CHOSEN GRADE 5 LEVEL      " << endl;
    cout << " ========================================= " << endl;
    cout << "      CHOOSE WHAT TYPE OF OPERATION      " << endl;
    cout << "            [1] ADDITION            " << endl;
    cout << "            [2] SUBTRACTION            " << endl;
    cout << "            [3] MULTIPLICATION         " << endl;
    cout << "            [4] DIVISION            " << endl;
    cout << "            [5] BACK TO MENU          " << endl;


    cout << "    ENTER THE NUMBER OF YOUR CHOICE: ";
    cin >> option;

    switch (option){

        case 1:
            cout << " ========================================= " << endl;
            cout << "      YOU HAVE CHOSEN ADDITION         " << endl;
            cout << " ========================================= " << endl;

            // to generate numbers
            for(int a = 1; a <= 10; a++) {

                // Retrieve a random number from 0.0 to 1000.0
                random_device ad;
                uniform_real_distribution<float>dist(0.0,1000.0);

                addOne = dist(ad); //needs to become 878.568
```

```cpp
        addOne *=100; //multiply to 100 to became 87868.87868
        addOne = trunc(addOne); //truncate to remove decimal place, 87856.0
        addOne /= 100; //divide to 100 to bring back the decimal place to the right place,
878.560

        addTwo = dist(ad); //needs to become 878.568
        addTwo *=100; //multiply to 100 to became 87868.87868
        addTwo = trunc(addOne); //truncate to remove decimal place, 87856.0
        addTwo /= 100; //divide to 100 to bring back the decimal place to the right place,
878.560


        // Will get the answer
        sum = addOne + addTwo;

        cout << "    " << a << "). " << addOne << " + " << addTwo << " = ";
        cin >> answer;
        catcher();


        if (sum == answer){
           updateScore += 1;
        }
     }

     cout << " ======================================== " << endl;
     cout << "      YOUR SCORE IS: " << updateScore << endl;
     cout << " ======================================== " << endl;
     break;

  case 2:
     cout << " ======================================== " << endl;
     cout << "      YOU HAVE CHOSEN SUBTRACTION        " << endl;
     cout << " ======================================== " << endl;


     // to generate numbers
     for(int a = 1; a <= 10; a++) {

        random_device sb;
        uniform_real_distribution<float>dist(0.0,1000.0);

        // Retrieve a random number from 0.0 to 1000.0
        subtra = ceil(dist(sb) * 100.0) / 100.0;
```

```cpp
        minu = ceil(dist(sb) * 100.0) / 100.0;

        // so that there will be no negative answer
        if (subtra > minu){//878.568
            diff = subtra-minu; //needs to become 878.568
            diff *=100; //multiply to 100 to became 87868.87868
            diff = trunc(diff); //truncate to remove decimal place, 87856.0
            diff /= 100; //divide to 100 to bring back the decimal place to the right place,
878.560

            cout << "    " << a << "). " << subtra << " - " << minu << " = ";
            cin >> answer;
            catcher();


        } else {//878.568
            diff = minu-subtra; //needs to become 878.568
            diff *=100; //multiply to 100 to became 87868.87868
            diff = trunc(diff); //truncate to remove decimal place, 87856.0
            diff /= 100; //divide to 100 to bring back the decimal place to the right place,
878.560

            cout << "    " << a << "). " << minu << " - " << subtra << " = ";
            cin >> answer;
            catcher();

        }

        if (diff == answer){
            updateScore += 1;
        }
    }
    cout << " ======================================== " << endl;
    cout << "      YOUR SCORE IS: " << updateScore << endl;
    cout << " ======================================== " << endl;
    break;

case 3:
    cout << " ======================================== " << endl;
    cout << "      YOU HAVE CHOSEN MULTIPLICATION          " << endl;
    cout << " ======================================== " << endl;
    cout << "  INSTRUCTIONS:                    " << endl;
    cout << "    PLEASE ENTER THE ANSWER IN TO THE      " << endl;
    cout << "    NEAREST HUNDREDTHS                " << endl;
```

```cpp
        cout << " ======================================= " << endl;


    // to generate numbers
    for(int a = 1; a <= 10; a++) {

        random_device multi;
        uniform_real_distribution<float>dist(0.0,99.0);

        // Retrieve a random number from 100 to 999
        mPlier = ceil(dist(multi) * 100.0) / 100.0;

        // Retrieve a random number from 10 to 99
        mPlicand = ceil(dist(multi) * 100.0) / 100.0;

        // Will get the answer
        product = ceil((mPlier * mPlicand) * 100.0) / 100.0;


        cout << "    " << a << "). " << mPlier << " X " << mPlicand << " = ";
        cin >> answer;
        catcher();


        if (product == answer){
            updateScore += 1;
        }
    }
}

    cout << " ======================================= " << endl;
    cout << "      YOUR SCORE IS: " << updateScore << endl;
    cout << " ======================================= " << endl;
    break;

case 4:
    cout << " ======================================= " << endl;
    cout << "      YOU HAVE CHOSEN DIVISION         " << endl;
    cout << " ======================================= " << endl;
    cout << "  INSTRUCTIONS:                   " << endl;
    cout << "    PLEASE ENTER THE QUOTIENT          " << endl;
    cout << "    AND GET TWO DECIMAL PLACES          " << endl;
    cout << "                                " << endl;
    cout << "    !!DO NOT ROUND OFF!!              " << endl;
    cout << " ======================================= " << endl;
```

```cpp
        for (int a = 1; a <= 10; a++) {

            // Retrieve a random number from 1 to 10
            diviDend = 100.0 + (rand() % 989);
            diviSor = 10 + (rand() % 89);


            qout = diviDend/diviSor; //needs to become 878.568
            qout *=100; //multiply to 100 to became 87868.87868
            qout = trunc(qout); //truncate to remove decimal place, 87856.0
            qout /= 100; //divide to 100 to bring back the decimal place to the right place, 878.560


            cout << "   " << a << "). " << diviDend << " / " << diviSor << " = ";
            cin >> answer;
            catcher();


            if (qout == answer) {
                updateScore += 1;
            }
        }

        cout << " ========================================= " << endl;
        cout << "       YOUR SCORE IS: " << updateScore << endl;
        cout << " ========================================= " << endl;
        break;

    case 5:
        option = 0;
        spacer();
        gradeLevel();
        break;
    }
    tryAgain();
}

void gradeSixChoice(){ // for grade 2 add,multiply, subtract, divide numbers up to 100
    int radius;
    float answer, cir, area;
    float perimeter, aSide, bSide, cSide;
    float base, height;
    float length, width;
```

```cpp
cout << " ========================================= " << endl;
cout << "      YOU HAVE CHOSEN GRADE 6 LEVEL      " << endl;
cout << " ========================================= " << endl;
cout << "      CHOOSE WHAT TYPE OF OPERATION      " << endl;
cout << "           [1] CIRCLE               " << endl;
cout << "           [2] TRIANGLE              " << endl;
cout << "           [3] RECTANGLE              " << endl;
cout << "           [4] SQUARE               " << endl;
cout << "           [5] BACK TO MENU           " << endl;


cout << "   ENTER THE NUMBER OF YOUR CHOICE: ";
cin >> option;

switch (option) {
   case 1:
      cout << " ======================================= " << endl;
      cout << "      YOU HAVE CHOSEN CIRCLE          " << endl;
      cout << " ======================================= " << endl;

      cout << "      CHOOSE WHAT TYPE TO SOLVE         " << endl;
      cout << "          [1] CIRCUMFERENCE          " << endl;
      cout << "          [2] AREA              " << endl;
      cout << "          [3] BACK TO MENU           " << endl;


      cout << "   ENTER THE NUMBER OF YOUR CHOICE: ";
      cin >> option;

      switch (option) {
         case 1:
            for (int a = 1; a <= 5; a++) {

               radius = 1 + rand() % 98;

               cout << " ======================================= " << endl;
               cout << "  NO " << a << ":      " << endl;
               cout << " ======================================= " << endl;
               cout << "  GIVEN:       " << endl;
               cout << "   RADIUS: " << radius << endl;
               cout << "   PI: 3.14    " << endl;
               cout << " ======================================= " << endl;
               cout << "  FORMULA: 2 x PI x RADIUS       " << endl;
               cout << " ======================================= " << endl;
```

```cpp
        cout << "   SOLVE FOR CIRCUMFERENCE:       " << endl;
        cout << "   ENTER CIRCUMFERENCE: ";
        cin >> answer;
        catcher();

        cout << " ======================================= " << endl;
        cout << " " << endl;

        //Solve for circumference
        cir = 2 * PI * radius;

        if (cir == answer) {
          updateScore += 1;
        }
      }

    cout << " ======================================= " << endl;
    cout << "      YOUR SCORE IS: " << updateScore << endl;
    cout << " ======================================= " << endl;
    break;

  case 2:
    for (int a = 1; a <= 5; a++) {

      radius = 1 + rand() % 98;

        cout << " ======================================= " << endl;
        cout << "   NO " << a << ":       " << endl;
        cout << " ======================================= " << endl;
        cout << "   GIVEN:       " << endl;
        cout << "    RADIUS: " << radius << endl;
        cout << "    PI: 3.14     " << endl;
        cout << " ======================================= " << endl;
        cout << "   FORMULA: PI x RADIUS^2              " << endl;
        cout << " ======================================= " << endl;
        cout << "   SOLVE FOR AREA:                   " << endl;
        cout << "   ENTER AREA: ";
        cin >> answer;
        catcher();

        cout << " ======================================= " << endl;
        cout << " " << endl;

        //Solve for circumference
```

```cpp
            area = PI * pow(radius, 2);

            if (area == answer) {
                updateScore += 1;
            }
        }

        cout << " ======================================= " << endl;
        cout << "      YOUR SCORE IS: " << updateScore << endl;
        cout << " ======================================= " << endl;
        break;
    case 3:
        option = 0;
        spacer();
        gradeLevel();
        break;
    }
break;
case 2:
    cout << " ======================================= " << endl;
    cout << "      YOU HAVE CHOSEN TRIANGLE          " << endl;
    cout << " ======================================= " << endl;

    cout << "      CHOOSE WHAT TYPE TO SOLVE         " << endl;
    cout << "            [1] PERIMETER            " << endl;
    cout << "            [2] AREA                 " << endl;
    cout << "            [3] BACK TO MENU         " << endl;

    cout << "   ENTER THE NUMBER OF YOUR CHOICE: ";
    cin >> option;

    switch (option) {
      case 1:
        for (int a = 1; a <= 5; a++) {

            aSide = 1 + rand() % 98;
            bSide = 1 + rand() % 98;
            cSide = 1 + rand() % 98;

            cout << " ======================================= " << endl;
            cout << "   NO " << a << ":      " << endl;
            cout << " ======================================= " << endl;
            cout << "   GIVEN:      " << endl;
            cout << "    A SIDE: " << aSide << endl;
```

```cpp
            cout << "    B SIDE: " << bSide << endl;
            cout << "    C SIDE: " << cSide << endl;
            cout << " ======================================= " << endl;
            cout << "   FORMULA: P = A + B + C     " << endl;
            cout << " ======================================= " << endl;
            cout << "   SOLVE FOR PERIMETER:      " << endl;
            cout << "   ENTER PERIMETER: ";
            cin >> answer;
            catcher();

            cout << " ======================================= " << endl;
            cout << " " << endl;

            //Solve for perimeter
            perimeter = aSide + bSide + cSide;

            if (perimeter == answer) {
                updateScore += 1;
            }
        }
        cout << " ======================================= " << endl;
        cout << "      YOUR SCORE IS: " << updateScore << endl;
        cout << " ======================================= " << endl;
        break;

    case 2:
        for (int a = 1; a <= 5; a++) {

            base = 1 + rand() % 98;
            height = 1 + rand() % 98;

            cout << " ======================================= " << endl;
            cout << "   NO " << a << ":      " << endl;
            cout << " ======================================= " << endl;
            cout << "   GIVEN:      " << endl;
            cout << "    BASE: " << base << endl;
            cout << "    HEIGHT : " << height << endl;
            cout << " ======================================= " << endl;
            cout << "   FORMULA: A = 1/2 * B * H      " << endl;
            cout << " ======================================= " << endl;
            cout << "   SOLVE FOR AREA:      " << endl;
            cout << "   ENTER AREA: ";
            cin >> answer;
            catcher();
```

```cpp
            cout << " ========================================= " << endl;
            cout << " " << endl;

            //Solve for AREA
            area = 0.5 * base * height;

            if (area == answer) {
               updateScore += 1;
            }
         }
         cout << " ========================================= " << endl;
         cout << "      YOUR SCORE IS: " << updateScore << endl;
         cout << " ========================================= " << endl;
         break;

      case 3:
         option = 0;
         spacer();
         gradeLevel();
         break;
   }
   break;

case 3:
   cout << " ========================================= " << endl;
   cout << "      YOU HAVE CHOSEN RECTANGLE         " << endl;
   cout << " ========================================= " << endl;

   cout << "      CHOOSE WHAT TYPE TO SOLVE         " << endl;
   cout << "           [1] PERIMETER            " << endl;
   cout << "           [2] AREA                 " << endl;
   cout << "           [3] BACK TO MENU         " << endl;


   cout << "   ENTER THE NUMBER OF YOUR CHOICE: ";
   cin >> option;

   switch (option) {
      case 1:
         for (int a = 1; a <= 5; a++) {

            length = 1 + rand() % 98;
            width = 1 + rand() % 98;
```

```cpp
            cout << " ===================================== " << endl;
            cout << "   NO " << a << ":        " << endl;
            cout << " ===================================== " << endl;
            cout << "   GIVEN:       " << endl;
            cout << "    LENGTH: " << length << endl;
            cout << "    WIDTH: " << width << endl;
            cout << " ===================================== " << endl;
            cout << "   FORMULA: P = 2 (L + W)              " << endl;
            cout << " ===================================== " << endl;
            cout << "   SOLVE FOR PERIMETER:       " << endl;
            cout << "   ENTER PERIMETER: ";
            cin >> answer;
            catcher();

            cout << " ===================================== " << endl;
            cout << " " << endl;

            //Solve for perimeter
            perimeter = 2*(length+width);

            if (perimeter == answer) {
                updateScore += 1;
            }
        }
        cout << " ===================================== " << endl;
        cout << "      YOUR SCORE IS: " << updateScore << endl;
        cout << " ===================================== " << endl;
        break;

    case 2:
        for (int a = 1; a <= 5; a++) {

            length = 1 + rand() % 98;
            width = 1 + rand() % 98;

            cout << " ===================================== " << endl;
            cout << "   NO " << a << ":       " << endl;
            cout << " ===================================== " << endl;
            cout << "   GIVEN:       " << endl;
            cout << "    LENGTH: " << length << endl;
            cout << "    WIDTH: " << width << endl;
            cout << " ===================================== " << endl;
            cout << "   FORMULA: A = W * L      " << endl;
```

```cpp
                cout << " ======================================= " << endl;
                cout << "   SOLVE FOR AREA:        " << endl;
                cout << "   ENTER AREA: ";
                cin >> answer;
                catcher();

                cout << " ======================================= " << endl;
                cout << " " << endl;

                //Solve for perimeter
                area = width * length;

                if (area == answer) {
                    updateScore += 1;
                }
            }
            cout << " ======================================= " << endl;
            cout << "      YOUR SCORE IS: " << updateScore << endl;
            cout << " ======================================= " << endl;
            break;
        case 3:
            option = 0;
            spacer();
            gradeLevel();
            break;
    }
    break;
case 4:
    cout << " ======================================= " << endl;
    cout << "      YOU HAVE CHOSEN SQUARE         " << endl;
    cout << " ======================================= " << endl;

    cout << "     CHOOSE WHAT TYPE TO SOLVE         " << endl;
    cout << "           [1] PERIMETER          " << endl;
    cout << "           [2] AREA               " << endl;
    cout << "           [3] BACK TO MENU          " << endl;

    cout << "   ENTER THE NUMBER OF YOUR CHOICE: ";
    cin >> option;

    switch (option) {
        case 1:
            for (int a = 1; a <= 5; a++) {
```

```cpp
      aSide = 1 + rand() % 98;

      cout << " ======================================= " << endl;
      cout << "   NO " << a << ":        " << endl;
      cout << " ======================================= " << endl;
      cout << "   GIVEN:      " << endl;
      cout << "    aSide: " << aSide << endl;
      cout << " ======================================= " << endl;
      cout << "   FORMULA: P = 4 * A              " << endl;
      cout << " ======================================= " << endl;
      cout << "   SOLVE FOR PERIMETER:      " << endl;
      cout << "   ENTER PERIMETER: ";
      cin >> answer;
      catcher();

      cout << " ======================================= " << endl;
      cout << " " << endl;

      //Solve for perimeter
      perimeter = 4 * aSide;

      if (perimeter == answer) {
        updateScore += 1;
      }
    }
    cout << " ======================================= " << endl;
    cout << "      YOUR SCORE IS: " << updateScore << endl;
    cout << " ======================================= " << endl;
    break;

  case 2:
    for (int a = 1; a <= 5; a++) {

      aSide = 1 + rand() % 98;

      cout << " ======================================= " << endl;
      cout << "   NO " << a << ":        " << endl;
      cout << " ======================================= " << endl;
      cout << "   GIVEN:      " << endl;
      cout << "    LENGTH: " << aSide << endl;
      cout << " ======================================= " << endl;
      cout << "   FORMULA: A = A^2 " << endl;
      cout << " ======================================= " << endl;
      cout << "   SOLVE FOR AREA:      " << endl;
```

```cpp
                    cout << "   ENTER AREA: ";
                    cin >> answer;
                    catcher();

                    cout << " ======================================= " << endl;
                    cout << " " << endl;

                    //Solve for perimeter
                    area = pow(aSide,2);

                    if (area == answer) {
                        updateScore += 1;
                    }
                }
                cout << " ======================================= " << endl;
                cout << "      YOUR SCORE IS: " << updateScore << endl;
                cout << " ======================================= " << endl;
                break;
              case 3:
                  option = 0;
                  spacer();
                  gradeLevel();
                  break;
            }
            break;
        case 5:
            option = 0;
            spacer();
            gradeLevel();
            break;
    }
    tryAgain();
}
```