

Q.3 WAP to check if three points (x_1, y_1) , (x_2, y_2) and (x_3, y_3) are collinear or not.

```
#include <stdio.h>
```

```
int main ()
```

```
{
```

```
    int x1, y1, x2, y2, x3, y3, area;
```

```
    printf("Enter the coordinates of first point (x1, y1);");
```

```
    scanf("%d %d", &x1, &y1);
```

```
    printf("Enter the coordinates of second point (x2, y2);");
```

```
    scanf("%d %d", &x2, &y2);
```

```
    printf("Enter the coordinates of third point (x3, y3);");
```

```
    scanf("%d %d", &x3, &y3);
```

```
    area = 0.5 * ((x1 * (y2 - y3) + (x2 * (y3 - y1) + (x3 * (y1 - y2))));
```

```
    if (area == 0)
```

```
        printf("The points are collinear \n");
```

```
    else
```

```
        printf("The points are not collinear. \n");
```

```
    return 0;
```

```
}
```

The image shows a code editor window with a file named `main.c`. The code is written in C and includes headers for `stdio.h` and `math.h`. It defines a `main` function that prompts the user to enter the coordinates of three points. The coordinates entered are (1, 1), (2, 2), and (3, 3). The program calculates the area of the triangle formed by these points using the formula $area = 0.5 * (x1 * (y2 - y3) + x2 * (y3 - y1) + x3 * (y1 - y2))$. Since the area is 0.00, it prints "The points are collinear." and "The area of the triangle formed by these points is: 0.00". The output window on the right shows the execution results, confirming that the code executed successfully.

```
1 #include <stdio.h>
2 #include <math.h>
3
4 int main() {
5     int x1, y1, x2, y2, x3, y3;
6     float area;
7
8     printf("Enter the coordinates of first point (x1, y1): ");
9     scanf("%d %d", &x1, &y1);
10
11     printf("Enter the coordinates of second point (x2, y2): ");
12     scanf("%d %d", &x2, &y2);
13
14     printf("Enter the coordinates of third point (x3, y3): ");
15     scanf("%d %d", &x3, &y3);
16
17     area = 0.5 * (x1 * (y2 - y3) + x2 * (y3 - y1) + x3 * (y1 - y2));
18
19     if (fabs(area) < 0.0001) {
20         printf("The points are collinear.\n");
21     } else {
22         printf("The points are not collinear.\n");
23     }
24
25     printf("The area of the triangle formed by these points is: %f\n", area);
26 }
```

Output

```
Enter the coordinates of first point (x1, y1): 1 1
Enter the coordinates of second point (x2, y2): 2 2
Enter the coordinates of third point (x3, y3): 3 3
The points are collinear.
The area of the triangle formed by these points is: 0.00

=== Code Execution Successful ===
```