Seventeenth century French mathematician Rene Descartes applied algebra principles to geometric situations. This blending of algebra and geometry is referred to as analytic geometry. Since this process often involves placing geometric figures in a coordinate plane, it is commonly known as coordinate geometry.

Coordinate geometry proofs employ the use of formulas such as the Slope Formula, the Midpoint Formula and the Distance Formula, as well as postulates, theorems and definitions.

For this problem you are to implement a function to find the distance between 2 points on a plane, the distance formula:

Slope Formula	**Midpoint Formula**	**Distance Formula**
$m = \frac{y_2 - y_1}{x_2 - x_1}$	$(x, y) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$	$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

Here is the header of your function:

```
double distance(int x1, int y1, int x2, int y2);
```

Then make the following table that displays the following x and y coordinates for 2 points and the distance between them:

x1	y1	x2	y2	Distance
1	5	-1	-1	6.3
3	6	-2	-4	11.2
5	7	-3	-7	16.1
7	8	-4	-10	21.1
9	9	-5	-13	26.1
11	10	-6	-16	31.1
13	11	-7	-19	36.1
15	12	-8	-22	41.0
17	13	-9	-25	46.0
19	14	-10	-28	51.0
21	15	-11	-31	56.0
23	16	-12	-34	61.0
25	17	-13	-37	66.0
27	18	-14	-40	71.0
29	19	-15	-43	76.0
31	20	-16	-46	81.0
33	21	-17	-49	86.0
35	22	-18	-52	91.0
37	23	-19	-55	96.0
39	24	-20	-58	101.0
41	25	-21	-61	106.0
43	26	-22	-64	111.0
45	27	-23	-67	116.0
47	28	-24	-70	121.0
49	29	-25	-73	126.0
51	30	-26	-76	131.0

Now implement the slope formula to find the slope between 2 points on a plane, here is the header for your function you are to write to do this:

```
double slope(int x1, int y1, int x2, int y2);
```

Now add a column to the table to show the slope in between the 2 points:

x1	y1	x2	y2	Distance	Slope
1	5	-1	-1	6.3	3.00
3	6	-2	-4	11.2	2.00
5	7	-3	-7	16.1	1.75
7	8	-4	-10	21.1	1.64
9	9	-5	-13	26.1	1.57
11	10	-6	-16	31.1	1.53
13	11	-7	-19	36.1	1.50
15	12	-8	-22	41.0	1.48
17	13	-9	-25	46.0	1.46
19	14	-10	-28	51.0	1.45
21	15	-11	-31	56.0	1.44
23	16	-12	-34	61.0	1.43
25	17	-13	-37	66.0	1.42
27	18	-14	-40	71.0	1.41
29	19	-15	-43	76.0	1.41
31	20	-16	-46	81.0	1.40
33	21	-17	-49	86.0	1.40
35	22	-18	-52	91.0	1.40
37	23	-19	-55	96.0	1.39
39	24	-20	-58	101.0	1.39
41	25	-21	-61	106.0	1.39
43	26	-22	-64	111.0	1.38
45	27	-23	-67	116.0	1.38
47	28	-24	-70	121.0	1.38
49	29	-25	-73	126.0	1.38
51	30	-26	-76	131.0	1.38

Thinking Questions:

Use your code to answer the following 2 questions. Print out the answer to these questions in your program.

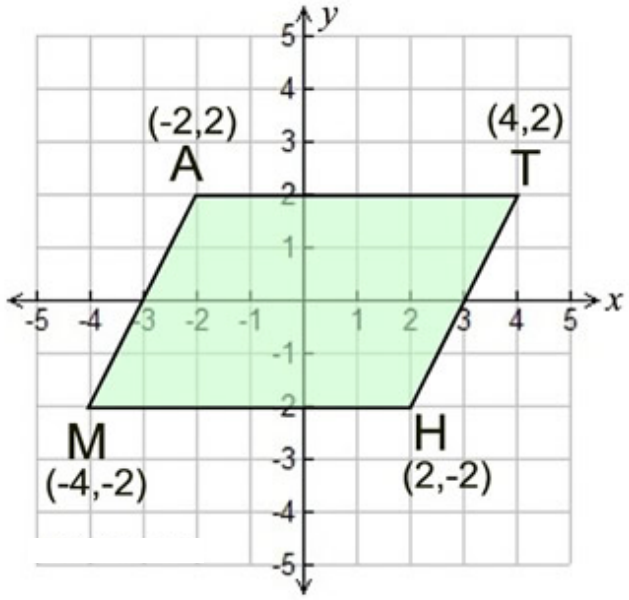
Here are a couple of useful definitions:

parallelogram: a quadrilateral with opposite sides parallel and equal

equilateral triangle: a triangle in which all three sides are equal.

Problem 1:

Given: quadrilateral *MATH*; *M*(-4,-2), *A*(-2,2), *T*(4,2) and *H*(2,-2)
Prove: *MATH* is a parallelogram



Problem 2:

Given: ΔDEF with *D*(-3,3), *E*(3,3), *F*(0,-3)
Show: ΔDEF is **NOT** an equilateral triangle