Algebra 1A Homework 4.3 Question #7

Example #1

(0, 0) (1, 4) (2, 16) (3, 36) (4, 64)

List the ordered pairs in a table.

x	y
0	0
1	4
2	16
3	36
4	64

The patterns in Lesson 4-3 seem to be either linear, quadratic (x^2), or cubic (x^3). We can easily see that the y-values in this pattern are not increasing in a linear way. So we can try quadratic first. Then if we need to, we'll try cubic.

x	y	x^2
0	0	0
1	4	1
2	16	4
3	36	9
4	64	16

Compare the values in the y-column with values in the x^2-column. Notice that if we multiply each of the x^2-values by 4, we get exactly the y-values. So the function we're looking for is $y = 4x^2$.

x	y	x^2	$4x^2$
0	0	0	0
1	4	1	4
2	16	4	16
3	36	9	36
4	64	16	64

Example #2

(0, 0) (1, 3) (2, 12) (3, 27) (4, 48)

List the ordered pairs in a table.

x	y
0	0
1	3
2	12
3	27
4	48

The patterns in Lesson 4-3 seem to be either linear, quadratic (x^2), or cubic (x^3). We can easily see that the y-values in this pattern are not increasing in a linear way. So we can try quadratic first. Then if we need to, we'll try cubic.

x	y	x^2
0	0	0
1	3	1
2	12	4
3	27	9
4	48	16

Compare the values in the y-column with the values in the x^2-column. Notice that if we multiply each of the x^2-values by 3, we get exactly the y-values. So the function we're looking for is $y = 3x^2$.

x	y	x^2	$3x^2$
0	0	0	0
1	3	1	3
2	12	4	12
3	27	9	27
4	48	16	48

Example #3

(0, 0) (1, 5) (2, 40) (3, 135) (4, 320)

List the ordered pairs in a table.

x	y
0	0
1	5
2	40
3	135
4	320

The patterns in Lesson 4-3 seem to be either linear, quadratic (x^2), or cubic (x^3). We can easily see that the y-values in this pattern are not increasing in a linear way. So we can try quadratic first. Then if we need to, we'll try cubic.

x	y	x^2
0	0	0
1	5	1
2	40	4
3	135	9
4	320	16

Compare the values in the y-column with the values in the x^2-column. There is not one constant number that we can multiply the x^2-values with in order to get the y-values. At this point we should try the cubic function instead.

x	y	x^2	x^3
0	0	0	0
1	5	1	1
2	40	4	8
3	135	9	27
4	320	16	48

(Continued…)

(Example #3 continued)

Now compare the values in the y-column with the values in the x^3-column. Notice that if we multiply each of the x^3-values by 5, we get exactly the y-values. So the function we're looking for is $y = 5x^3$.

x	y	x^2	x^3	$5x^3$
0	0	0	0	0
1	5	1	1	5
2	40	4	8	40
3	135	9	27	135
4	320	16	48	320