

1. What type of relationship is indicated by the following set of ordered pairs? Explain how you know.

x	y
0	0
1	2
2	10
3	24
4	44

2. Find an equation that all ordered pairs above satisfy.

Create a table to find the second differences for the polynomial $36 - 16t^2$ for integer values of t from 0 to 5.

t	$36 - 16t^2$	First difference	Second difference
0			
1			
2			
3			
4			
5			

Find a polynomial function described here on table below.

1)

X	Y ₁			
0	1			
1	-1			
2	-1			
3	1			
4	5			
5	11			
6	19			
7	29			
8	41			
9	55			
10	71			

2)

X	Y ₁			
0	1			
1	-4			
2	-25			
3	-80			
4	-187			
5	-364			
6	-629			
7	-1000			
8	-1495			
9	-2132			
10	-2929			

3)

X	Y ₁			
0	2			
1	6			
2	28			
3	80			
4	174			
5	322			
6	536			
7	828			
8	1210			
9	1694			
10	2292			

4)

X	Y ₁			
0	1			
1	2			
2	7			
3	22			
4	53			
5	106			
6	187			
7	302			
8	457			
9	658			
10	911			

The following are values of functions. Use **finite differences to determine what type of function they represent.**

$$f(1) = 0$$

$$f(2) = -3$$

$$f(3) = -8$$

$$f(4) = -15$$

$$f(5) = -24$$

$$f(6) = -35$$

$$f(1) = -12$$

$$f(2) = -14$$

$$f(3) = -10$$

$$f(4) = 6$$

$$f(5) = 40$$

$$f(6) = 98$$

$$(1, -3)$$

$$(2, -1)$$

$$(3, 1)$$

$$(4, 3)$$

$$(5, 5)$$

$$(6, 7)$$

Long division

Divide.

1) $(m^2 - 7m - 11) \div (m - 8)$

2) $(n^2 - n - 29) \div (n - 6)$

3) $(n^2 + 10n + 18) \div (n + 5)$

4) $(k^2 - 7k + 10) \div (k - 1)$

5) $(n^2 - 3n - 21) \div (n - 7)$

6) $(a^2 - 28) \div (a - 5)$

7) $(r^2 + 14r + 38) \div (r + 8)$

8) $(x^2 + 5x + 3) \div (x + 6)$

9) $(2x^2 - 17x - 38) \div (2x + 3)$

10) $(42x^2 - 33) \div (7x + 7)$

$$11) (x^2 - 74) \div (x - 8)$$

$$12) (2p^2 + 7p - 39) \div (2p - 7)$$

$$13) (n^3 + 7n^2 + 14n + 3) \div (n + 2)$$

$$14) (p^3 - 10p^2 + 20p + 26) \div (p - 5)$$

$$15) (v^3 - 2v^2 - 14v - 5) \div (v + 3)$$

$$16) (x^3 - 13x^2 + 40x + 18) \div (x - 7)$$

$$17) (k^3 - 30k - 18 - 4k^2) \div (3 + k)$$

$$18) (-5k^2 + k^3 + 8k + 4) \div (-1 + k)$$

$$19) (x^3 + 5x^2 - 32x - 7) \div (x - 4)$$

$$20) (50k^3 + 10k^2 - 35k - 7) \div (5k - 4)$$

Synthetic division

Divide.

1) $(m^2 - 7m - 11) \div (m - 8)$

2) $(n^2 - n - 29) \div (n - 6)$

3) $(n^2 + 10n + 18) \div (n + 5)$

4) $(k^2 - 7k + 10) \div (k - 1)$

5) $(n^2 - 3n - 21) \div (n - 7)$

6) $(a^2 - 28) \div (a - 5)$

7) $(r^2 + 14r + 38) \div (r + 8)$

8) $(x^2 + 5x + 3) \div (x + 6)$

9) $(2x^2 - 17x - 38) \div (2x + 3)$

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$$18) (-5k^2 + k^3 + 8k + 4) \div (-1 + k)$$

$$19) (x^3 + 5x^2 - 32x - 7) \div (x - 4)$$

$$20) (50k^3 + 10k^2 - 35k - 7) \div (5k - 4)$$