ANSWER PRESENTATION TOOL

Algebra 2 - Student Edit 4 9 - Practice 1-10 ALL EVEN Show Solı

ODD

1. Step 1 Use the three x-intercepts to write the function in factored form.

$f(x) = a(x + 1)(x - 1)(x - 2)$

Step 2 Find the value of a by substituting the coordinates of the point (0, 2).

$2 = a(0 + 1)(0 - 1)(0 - 2)$

$2 = 2a$

$1 = a$

The function is $f(x) = (x + 1)(x - 1)(x - 2)$.

2. Step 1 Use the three x-intercepts to write the function in factored form.

$f(x) = a(x + 3)(x + 1)(x - 2)$

Step 2 Find the value of a by substituting the coordinates of the point $(-2, 4)$.

$4 = a(-2 + 3)(-2 + 1)(-2 - 2)$

$4 = 4a$

$1 = a$

The function is $f(x) = (x + 3)(x + 1)(x - 2)$.

3. **Step 1** Use the three x-intercepts to write the function in factored form.

$f(x) = a(x + 5)(x - 1)(x - 4)$

Step 2 Find the value of a by substituting the coordinates of the point (2, −2).

$-2 = a(2 + 5)(2 - 1)(2 - 4)$

$-2 = -14a$

$\frac{1}{7} = a$

The function is $f(x) = \frac{1}{7}(x + 5)(x - 1)(x - 4)$.

4. **Step 1** Use the three x-intercepts to write the function in factored form.

$f(x) = a(x + 6)(x + 3)(x - 3)$

Step 2 Find the value of a by substituting the coordinates of the point (0, −9).

$-9 = a(0 + 6)(0 + 3)(0 - 3)$

$-9 = -54a$

$\frac{1}{6} = a$

The function is $f(x) = \frac{1}{6}(x + 6)(x + 3)(x - 3)$.

5. Step 1 Write the function values. Find the first differences by subtracting consecutive values. Then find the second differences by subtracting the consecutive first differences. Continue until you obtain differences that are nonzero and constant.

$f(-6)$	$f(-3)$	$f(0)$	$f(3)$	$f(6)$	$f(9)$
-2	15	-4	49	282	803

First differences: 17, -19, 53, 233, 521

Second differences: -36, 72, 180, 288

Third differences: 108, 108, 108

Because the third differences are nonzero and constant, you can model the data exactly with a cubic function.

Step 2 Use *cubic regression* to obtain a cubic model.

Because $\frac{2}{3} \approx 0.666667$ and $\frac{1}{3} \approx 0.333333$, a polynomial function that fits the data exactly is

$f(x) = \frac{2}{3}x^3 + 4x^2 - \frac{1}{3}x - 4.$

6. **Step 1** Write the function values. Find the first differences by subtracting consecutive values. Then find the second differences by subtracting the consecutive first differences. Continue until you obtain differences that are nonzero and constant.

$f(-1)$	$f(0)$	$f(1)$	$f(2)$	$f(3)$	$f(4)$
−14	−5	−2	7	34	91
9	3	9	27	57	
−6	6	18	30		
12	12	12			

Because the third differences are nonzero and constant, you can model the data exactly with a cubic function.

Step 2 Use *cubic regression* to obtain a cubic model.

A polynomial function that fits the data exactly is $f(x) = 2x^3 - 3x^2 + 4x - 5$.

7. Step 1 Write the function values. Find the first differences by subtracting consecutive values. Then find the second differences by subtracting the consecutive first differences. Continue until you obtain differences that are nonzero and constant.

$f(-4)$	$f(-3)$	$f(-2)$	$f(-1)$	$f(0)$	$f(1)$	$f(2)$	$f(3)$	$f(4)$
−317	−37	21	7	−1	3	−47	−289	−933

280 58 −14 −8 4 −50 −242 −644

−222 −72 6 12 −54 −192 −402

150 78 6 −66 −138 −210

−72 −72 −72 −72 −72

Because the fourth differences are nonzero and constant, you can model the data exactly with a quartic function.

Step 2 Use *quartic regression* to obtain a quartic model.

A polynomial function that fits the data exactly is
$f(x) = -3x^4 - 5x^3 + 9x^2 + 3x - 1$.

8. Step 1 Write the function values. Find the first differences by subtracting consecutive values. Then find the second differences by subtracting the consecutive first differences. Continue until you obtain differences that are nonzero and constant.

$f(-6)$	$f(-4)$	$f(-2)$	$f(0)$	$f(2)$	$f(4)$	$f(6)$	$f(8)$	$f(10)$
744	154	4	−6	16	154	684	2074	4984
−590	−150	−10	22	138	530	1390	2910	
440	140	32	116	392	860	1520		
−300	−108	84	276	468	660			
192	192	192	192	192				

Because the fourth differences are nonzero and constant, you can model the data exactly with a quartic function.

Step 2 Use *quartic regression* to obtain a quartic model.

A polynomial function that fits the data exactly is
$f(x) = \frac{1}{2}x^4 - \frac{1}{4}x^3 + 2x^2 + 4x - 6.$

9. Step 1 Write the function values. Find the first differences by subtracting consecutive values. Then find the second differences by subtracting the consecutive first differences. Continue until you obtain differences that are nonzero and constant.

$f(-2)$	$f(-1)$	$f(0)$	$f(1)$	$f(2)$	$f(3)$	$f(4)$	$f(5)$	$f(6)$
968	422	142	26	−4	−2	2	2	16
−546	−280	−116	−30	2	4	0	14	
266	164	86	32	2	−4	14		
−102	−78	−54	−30	−6	18			
24	24	24	24	24				

Because the fourth differences are nonzero and constant, you can model the data exactly with a quartic function.

Step 2 Use *quartic regression* to obtain a quartic model.

A polynomial function that fits the data exactly is
$f(x) = x^4 - 15x^3 + 81x^2 - 183x + 142.$

10. Step 1 Write the function values. Find the first differences by subtracting consecutive values. Then find the second differences by subtracting the consecutive first differences. Continue until you obtain differences that are nonzero and constant.

$f(1)$	$f(2)$	$f(3)$	$f(4)$	$f(5)$	$f(6)$	$f(7)$	$f(8)$	$f(9)$
0	6	2	6	12	−10	−114	−378	−904
6	−4	4	6	−22	−104	−264	−526	
−10	8	2	−28	−82	−160	−262		
18	−6	−30	−54	−78	−102			
−24	−24	−24	−24	−24				

Because the fourth differences are nonzero and constant, you can model the data exactly with a quartic function.

Step 2 Use *quartic regression* to obtain a quartic model.

A polynomial function that fits the data exactly is
$f(x) = -x^4 + 13x^3 - 58x^2 + 104x - 58$.