

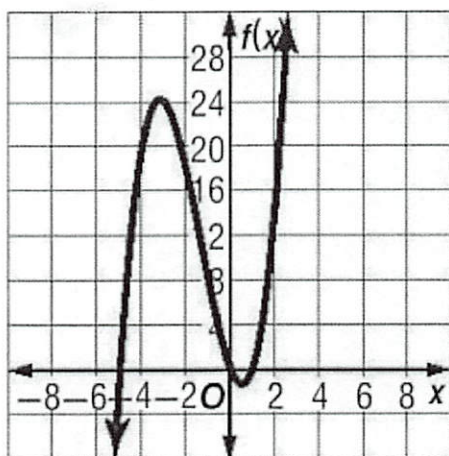
Complete each of the following.

- Graph each function by making a table of values.
- Determine the consecutive integer values of x between which each real zero is located.
- Estimate the x -coordinates at which the relative maxima and minima occur.

16. $f(x) = x^3 + 4x^2 - 5x$

16a.

x	$f(x)$
-6	-42
-5	0
-4	20
-3	24
-2	18
-1	8
0	0
1	0
2	14
3	48



16b. -5, 0, and 1

16c. rel. max: $x = -3$; rel. min: between $x = 0$ and $x = 1$

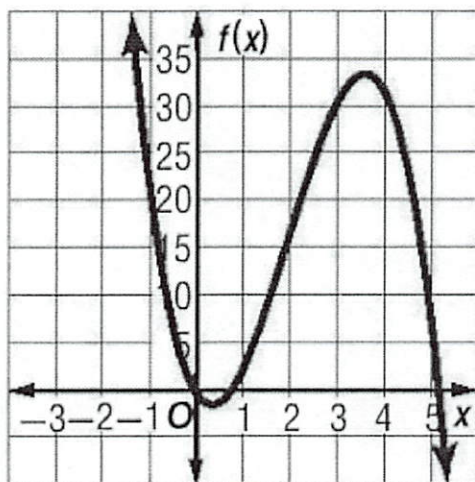
Complete each of the following.

- Graph each function by making a table of values.
- Determine the consecutive integer values of x between which each real zero is located.
- Estimate the x -coordinates at which the relative maxima and minima occur.

18. $f(x) = -2x^3 + 12x^2 - 8x$

18a.

x	$f(x)$
-1	22
0	0
1	2
2	16
3	30
4	32
5	10
6	-48
7	-154



18b. at 0, between 0 and 1, and between 5 and 6

18c. rel. min: between $x = 0$ and $x = 1$; rel. max: near $x = 4$

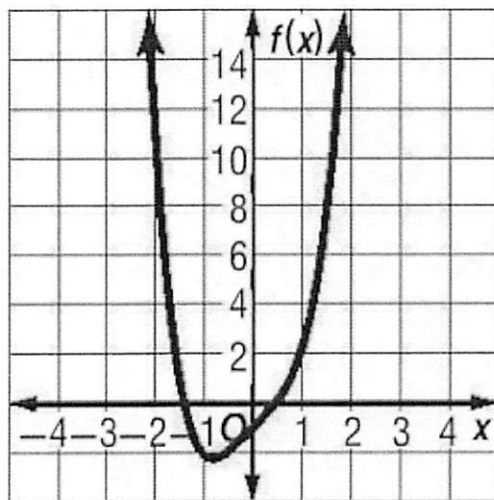
Complete each of the following.

- Graph each function by making a table of values.
- Determine the consecutive integer values of x between which each real zero is located.
- Estimate the x -coordinates at which the relative maxima and minima occur.

20. $f(x) = x^4 + 2x - 1$

20a.

x	$f(x)$
-4	247
-3	74
-2	11
-1	-2
0	-1
1	2
2	19
3	86
4	263

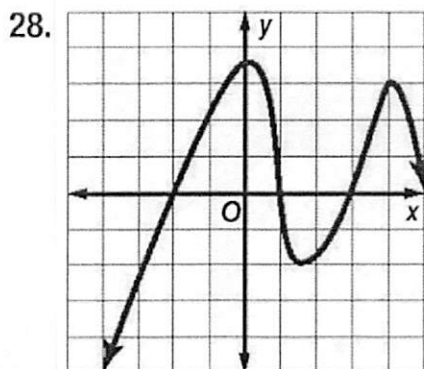


20b. between $x = -2$ and $x = -1$ and between $x = 0$ and $x = 1$

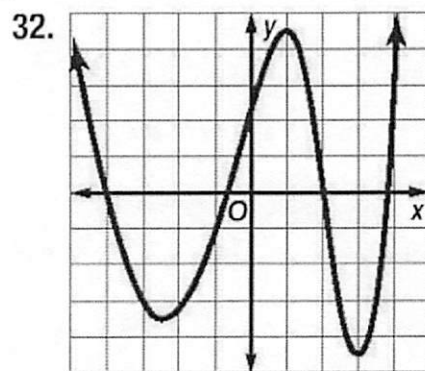
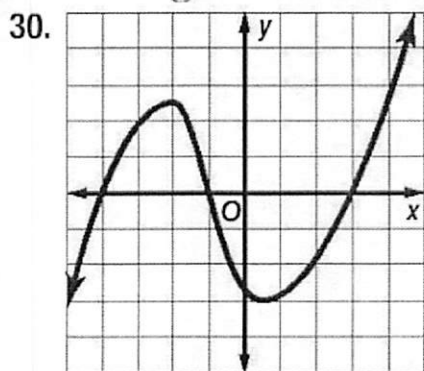
20c. rel. min: near $x = -1$; no rel. max

Sketch the graph of polynomial functions with the following characteristics.

28. an even function with zeros at -2 , 1 , 3 , and 5



30. a 5-degree function with zeros at -4 , -1 , and 3 , maximum at $x = -2$

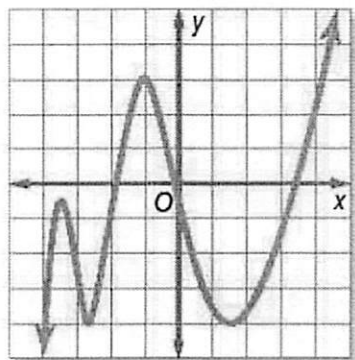


32. an even function with a minimum at $x = 3$ and a positive leading coefficient

Complete each of the following.

- Estimate the x -coordinate of every turning point and determine if those coordinates are relative maxima or relative minima.
- Estimate the x -coordinate of every zero.
- Determine the smallest possible degree of the function.
- Determine the domain and range of the function.

34.



34a. $-3.5(\text{max}), -2.5(\text{min}), -1(\text{max}), 2(\text{min})$

34b. $-1.75, -0.25, 3.5$

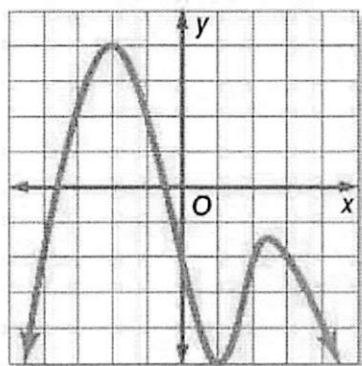
34c. 5

34d. $D = \{\text{all real numbers}\}; R = \{\text{all real numbers}\}$

Complete each of the following.

- Estimate the x -coordinate of every turning point and determine if those coordinates are relative maxima or relative minima.
- Estimate the x -coordinate of every zero.
- Determine the smallest possible degree of the function.
- Determine the domain and range of the function.

36.



36a. $-2(\text{max}), 1(\text{min}), 2.5(\text{max})$

36b. $-3.5, -0.5$

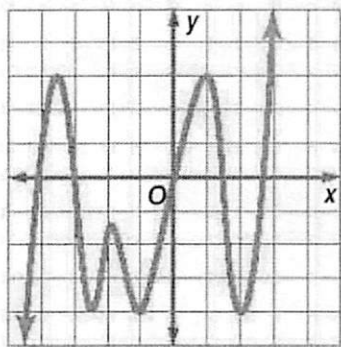
36c. 4

36d. $D = \{\text{all real numbers}\}; R = \{y \mid y \leq 4.1\}$

Complete each of the following.

- Estimate the x -coordinate of every turning point and determine if those coordinates are relative maxima or relative minima.
- Estimate the x -coordinate of every zero.
- Determine the smallest possible degree of the function.
- Determine the domain and range of the function.

38.



38a. $-3.5(\text{max}), -2.5(\text{min}), -1.75(\text{max}), -1(\text{min}), 1(\text{max}), 2(\text{min})$

38b. $-4, -3, 0, 1.5, 2.75$

38c. 7

38d. $D = \{\text{all real numbers}\}; R = \{\text{all real numbers}\}$

For each function,

- determine the zeros, x - and y -intercepts, and turning points,
- determine the axis of symmetry, and
- determine the intervals for which it is increasing, decreasing, or constant.

42. $y = x^4 - 8x^2 + 16$

42a. zeros: $x = \pm 2$; x -intercepts: ± 2 ;
 y -intercept: 16; turning points:
 $x = -2, 0, 2$

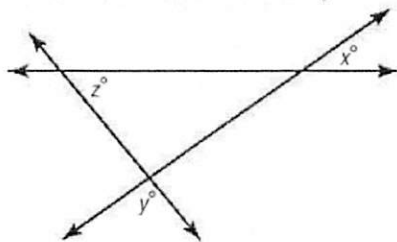
42b. $x = 0$

42c. decreasing: $x < -2$ and $0 < x < 2$;
increasing: $-2 < x < 0$
and $2 < x$

54. Which of the following is the factorization of $2x - 15 + x^2$? **B**

- A $(x - 3)(x - 5)$
- B $(x - 3)(x + 5)$
- C $(x + 3)(x - 5)$
- D $(x + 3)(x + 5)$

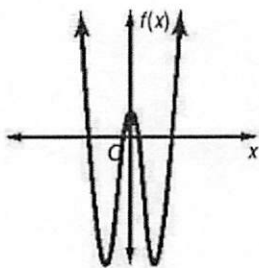
55. **SHORT RESPONSE** In the figure below, if $x = 35$ and $z = 50$, what is the value of y ? **95**



56. Which polynomial represents $(4x^2 + 5x - 3)(2x - 7)$? **H**

- F $8x^3 - 18x^2 - 41x - 21$
- G $8x^3 + 18x^2 + 29x - 21$
- H $8x^3 - 18x^2 - 41x + 21$
- J $8x^3 + 18x^2 - 29x + 21$

57. **SAT/ACT** The figure at the right shows the graph of a polynomial function $f(x)$. Which of the following could be the degree of $f(x)$? **C**



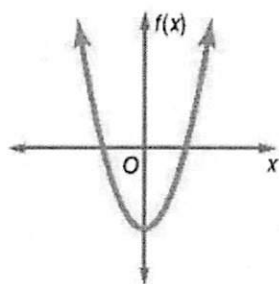
- A 2
- B 3
- C 4
- D 5
- E 6

For each graph,

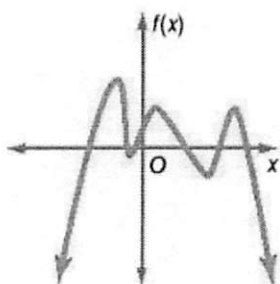
- describe the end behavior,
- determine whether it represents an odd-degree or an even-degree function, and
- state the number of real zeros.

38 points

58.



59.



60.

