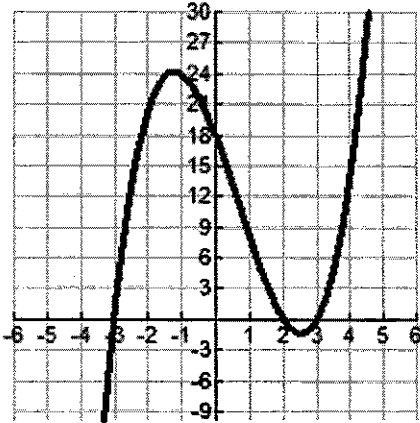


**Unit 3B review**  
Algebra II with support

Name:

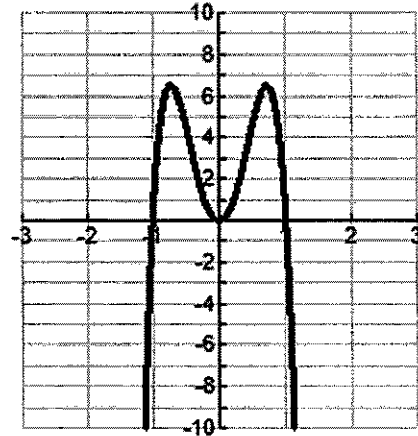
Tell if the lead coefficient of the polynomial equation is positive or negative and if the degree is even or odd by looking at the given graphs.

1.



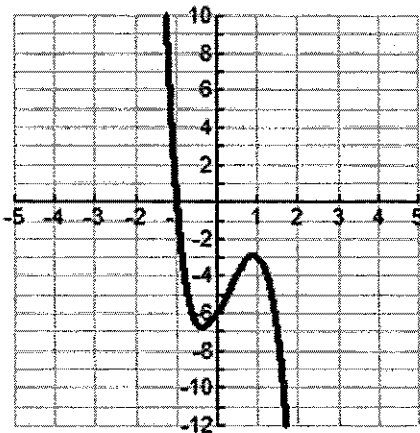
pos, odd

2.



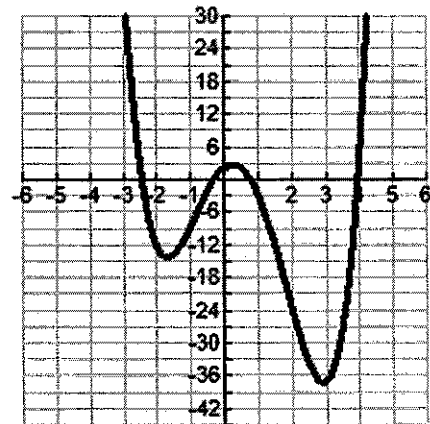
neg, even

3.



neg, odd

4.



pos, even

Given the following polynomial graphs, identify the characteristics.

5.

zeros:  $\{-3, 2\}$

y-intercept: 12

domain:  $(-\infty, \infty)$

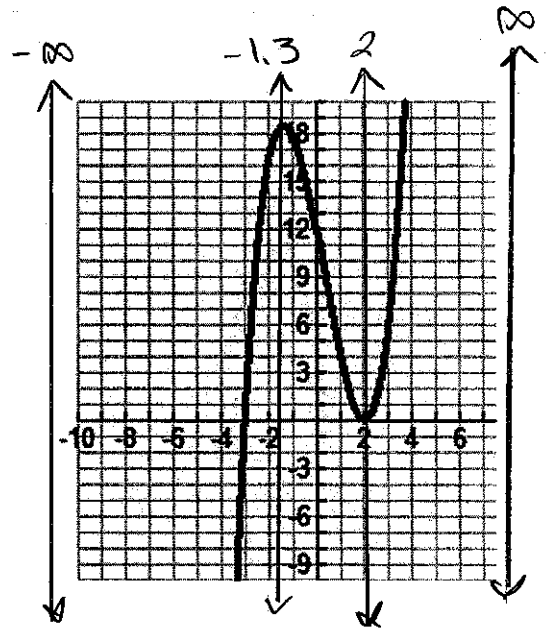
range:  $(-\infty, \infty)$

increasing:  $(-\infty, -1.3), (2, \infty)$

decreasing:  $(-1.3, 2)$

maximum:  $(-1.3, 18.7)$

minimum:  $(2, 0)$



6.

zeros:  $\{-3, -1, 0, 2\}$

y-intercept: 0

domain:  $(-\infty, \infty)$

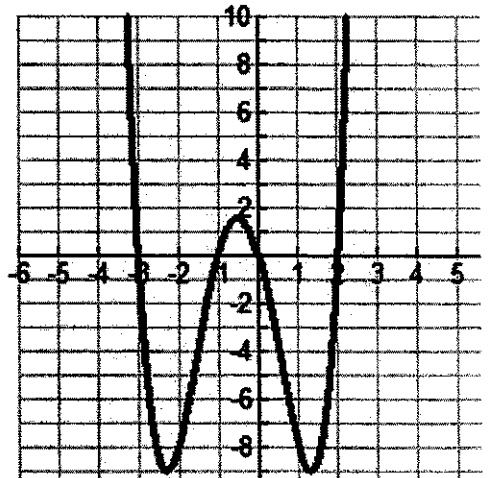
range:  $[-9, \infty)$

increasing:  $(-2.3, -0.5), (1.2, \infty)$

decreasing:  $(-8, -2.3), (-0.5, 1.2)$

maximum:  $(-2.3, -9)$

minimum:  $(1.2, -9)$



Given the following polynomial graphs, identify the characteristics.

7.

zeros:  $\{-2, 1, 3\}$

y-intercept:  $-6$

domain:  $(-\infty, \infty)$

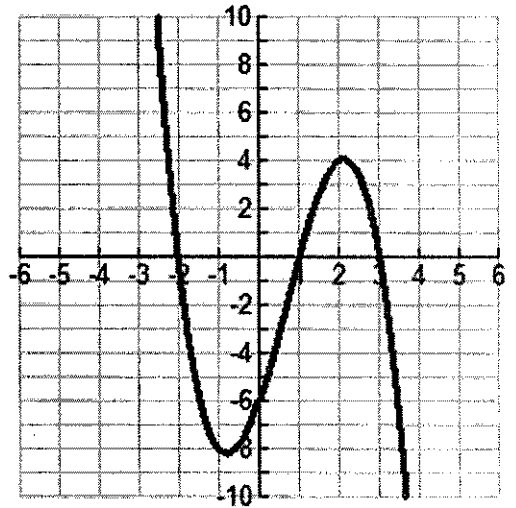
range:  $(-\infty, \infty)$

increasing:  $(-0.9, 2)$

decreasing:  $(-\infty, -0.9), (2, \infty)$

maximum:  $(2, 4)$

minimum:  $(-0.9, -8)$



Given the following characteristics, sketch the polynomial function.

8.

x-intercepts:  $(-3, 0), (-1, 0), (2, 0), (4, 0)$

y-intercept:  $(0, 4)$

domain:  $(-\infty, \infty)$

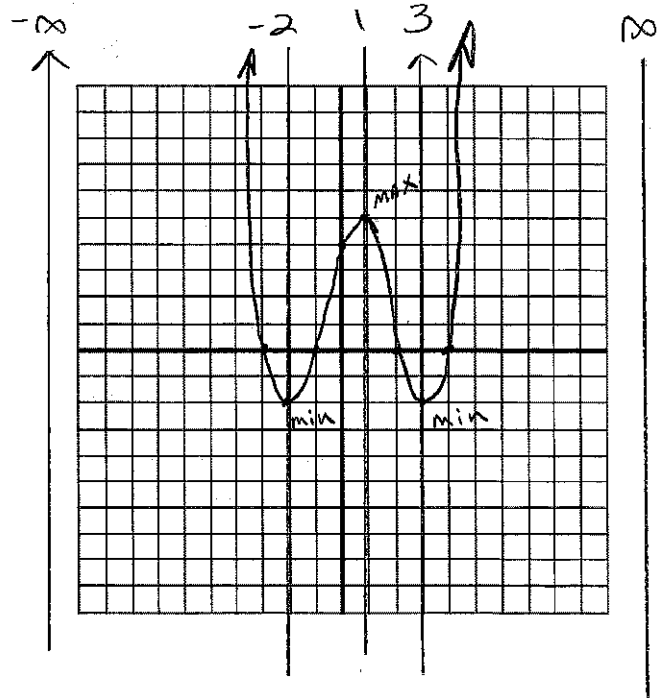
range:  $(-2, \infty)$

increasing:  $(-2, 1), (3, \infty)$

decreasing:  $(-\infty, -2), (1, 3)$

maximum:  $(1, 5)$

minimum:  $(-2, -2), (3, 2)$



Describe the end behavior of each function.

9.  $f(x) = x^3 + 6x^2 - 31x - 36$

$x \rightarrow \infty; f(x) \rightarrow \infty$

$x \rightarrow -\infty; f(x) \rightarrow -\infty$

10.  $f(x) = 3x^4 - x^3 + 11x^2 - 7x + 5$

$x \rightarrow \infty; f(x) \rightarrow \infty$

$x \rightarrow -\infty; f(x) \rightarrow \infty$

11.  $f(x) = -2x^6 - 3x^5 + 8x^3 + 2x$

$x \rightarrow \infty; f(x) \rightarrow -\infty$

$x \rightarrow -\infty; f(x) \rightarrow -\infty$

12.  $f(x) = -6x^7 + 12x^6 - 9x^4 - 3x^2 + 4x + 5$

$x \rightarrow \infty; f(x) \rightarrow -\infty$

$x \rightarrow -\infty; f(x) \rightarrow \infty$

Identify the number of solutions and the maximum number of extrema for each function.

13.  $f(x) = x^4 - 2x^3 - 10x^2 + 8x - 5$

Zeros: 4

Extrema:  $4 - 1 = 3$

14.  $f(x) = 2x^9 + 9x^6 + 3x^4 - 7x + 12$

Zeros: 9

Extrema:  $9 - 1 = 8$

15. When a function has a zero with multiplicity of 2, describe what the graph does with respect to the x axis.

touch + bounce

16. When a function has a zero with multiplicity of 3, describe what the graph does with respect to the x axis.

crosses through

17. Given the function  $f(x) = x^4 - 13x^2 + 36$  answer the following:

a. How many zeros are there? 4

b. Find the zeros.

$$\begin{aligned} & x^4 - 13x^2 + 36 \\ & (x^2 - 4)(x^2 - 9) \\ & x = \pm 2 \quad x = \pm 3 \end{aligned}$$

c. Find the y-int.

$$y_{\text{int}} : 36$$

d. Where are the local maximums if they exist?

$$(0, 36)$$

e. Where are the local minimums if they exist?

$$\text{min} (-2.5, -6.25)$$

$$\text{min} (2.5, -6.25)$$

f. Describe the end behavior

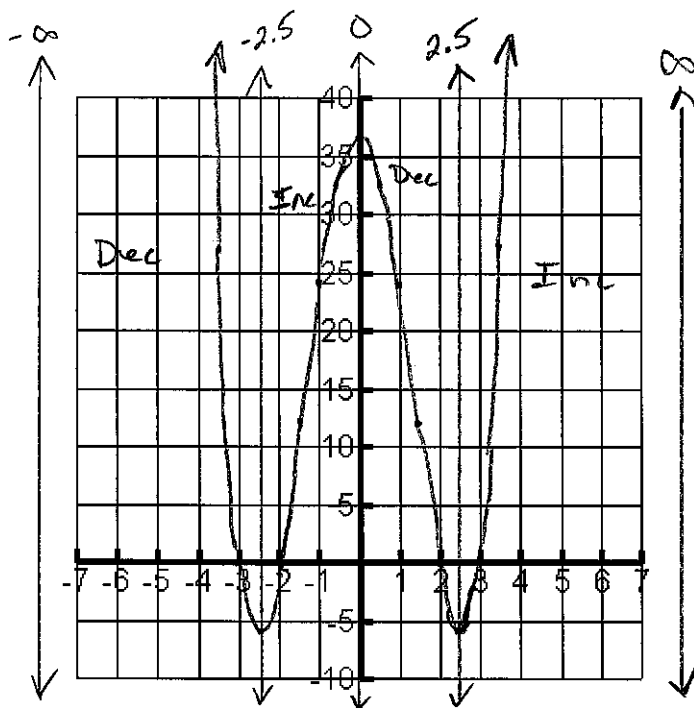
$$x \rightarrow \infty; f(x) \rightarrow \infty$$

$$x \rightarrow -\infty; f(x) \rightarrow \infty$$

g. What is the maximum number of extrema?

$$4 - 1 = 3$$

h. Graph the polynomial



i. domain:  $(-\infty, \infty)$

range:  $[-6.25, \infty)$

j. increasing:  $(-2.5, 0), (2.5, \infty)$

decreasing:  $(-\infty, -2.5), (0, 2.5)$