

**Math 3 Unit 3 Worksheet 1**  
**End Behavior of Polynomial Functions**

**Name:** \_\_\_\_\_  
**Date:** \_\_\_\_\_ **Per:** \_\_\_\_\_

Identify the leading coefficient, degree, and end behavior.

1.  $f(x) = 5x^2 + 7x - 3$

Degree:

Leading Coeff:

End Behavior:

2.  $y = -2x^2 - 3x + 4$

Degree:

Leading Coeff:

End Behavior:

3.  $g(x) = x^3 - 9x^2 + 2x + 6$

Degree:

Leading Coeff:

End Behavior:

4.  $y = -7x^3 + 3x^2 + 12x - 1$

Degree:

Leading Coeff:

End Behavior:

5.  $h(x) = -2x^7 + 5x^4 - 3x$

Degree:

Leading Coeff:

End Behavior:

6.  $g(x) = 8x^3 + 4x^2 + 7x^4 - 9x$

Degree:

Leading Coeff:

End Behavior:

Identify the end behavior. Justify your answer.

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

8.  $y = -x^4 + x^3 - x^2 + 1 - 1$

9.  $h(x) = 3x^6 - 7x^4 - 2x^9$

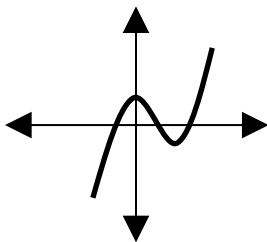
Identify whether the function graphed has an odd or even degree and a positive or negative leading coefficient. Justify your answer.

10.

deg:

coeff:

justify:

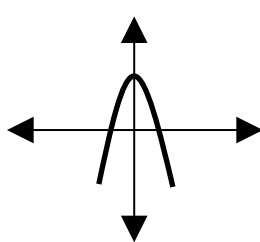


11.

deg:

coeff:

justify:

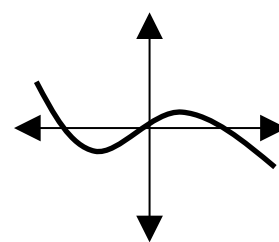


12.

deg:

coeff:

justify:

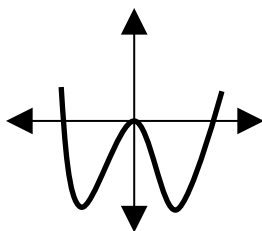


13.

deg:

coeff:

justify:

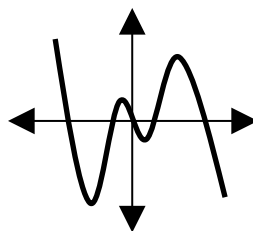


14.

deg:

coeff:

justify:

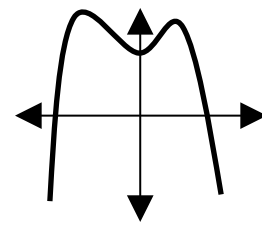


15.

deg:

coeff:

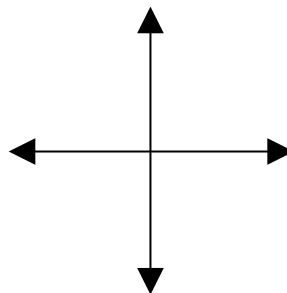
justify:



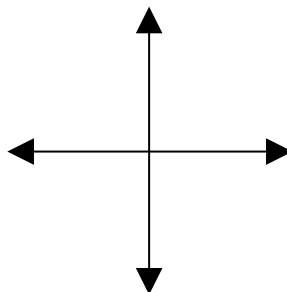
16. Write a polynomial function with end behavior of:  
on the left  $f(x)$  goes to  $+\infty$  and on the right  $f(x)$  goes to  $-\infty$ .

17. Write a polynomial function with end behavior of:  
on the left  $f(x)$  goes to  $+\infty$  and on the right  $f(x)$  goes to  $+\infty$ .

18. Sketch a graph of a polynomial function with  
a negative lead coefficient and an even degree.



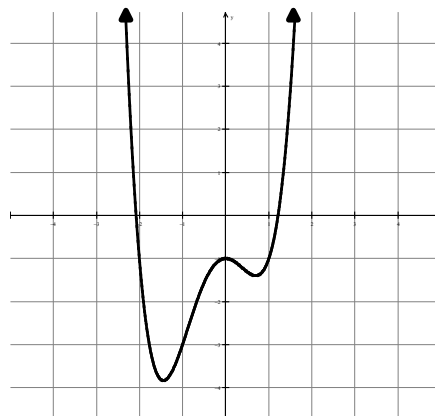
19. Sketch a graph of a polynomial function with  
a positive lead coefficient and an odd degree.



20. The equation of the polynomial function to the right is

$$f(x) = x^4 + x^3 - 2x^2 - 1$$

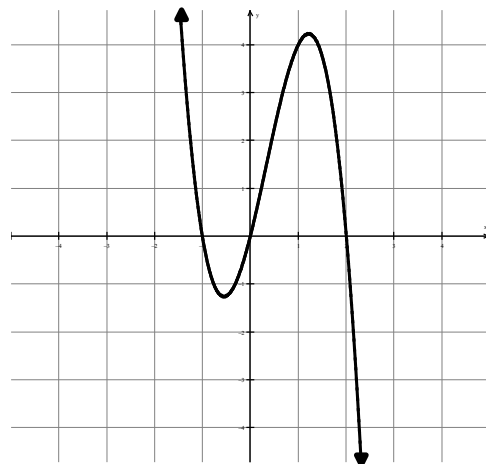
Write an equation for a translation  
of  $f(x)$  that has no  $x$ -intercepts.  
(If not possible, explain why.)



21. The equation of the polynomial function to the right is

$$g(x) = -2x^3 + 2x^2 + 4x$$

Write an equation for a translation  
of  $g(x)$  that has no  $x$ -intercepts.  
(If not possible, explain why.)



Determine the degree of the polynomial in factored form. Then demonstrate that you are correct by writing the polynomial in standard form.

22.  $y = (x + 3)(x^2 - 5x - 4)$

23.  $y = x^3(x - 2)^2(x + 1)$

24.  $y = x(x + 3)(x - 1)^2$

25. Describe in words how you can know the degree without multiplying out to write the polynomial in standard form.

