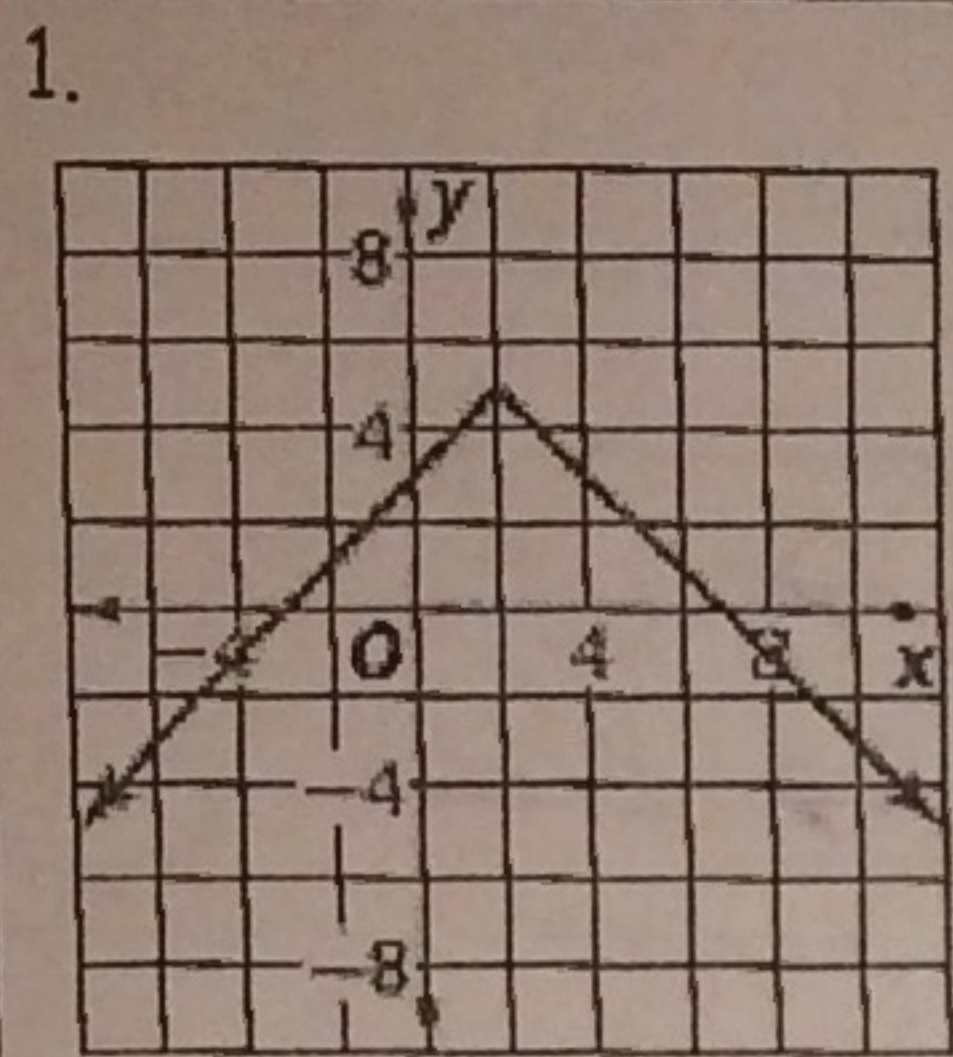


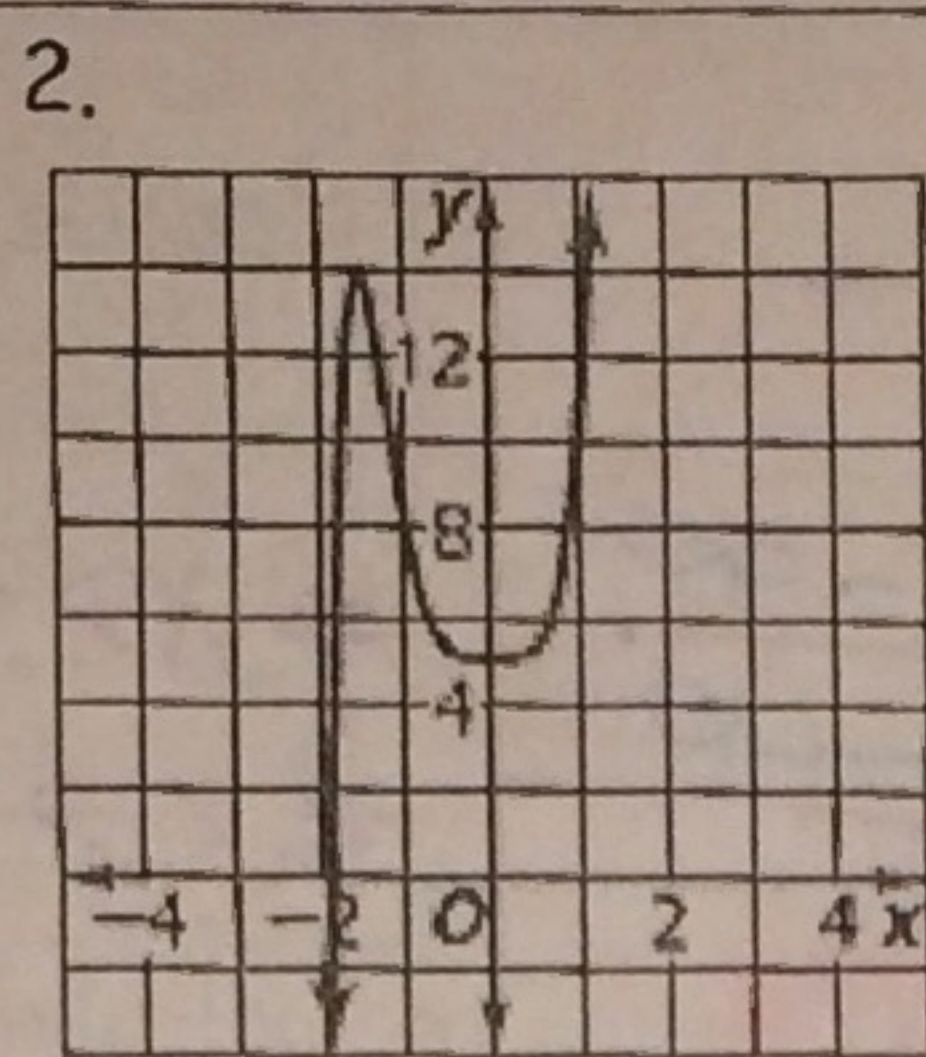
Section 2.2 - Polynomial Functions DAY ONE

Determine whether each graph could be a POLYNOMIAL function. Write YES or NO, explain why or why not.

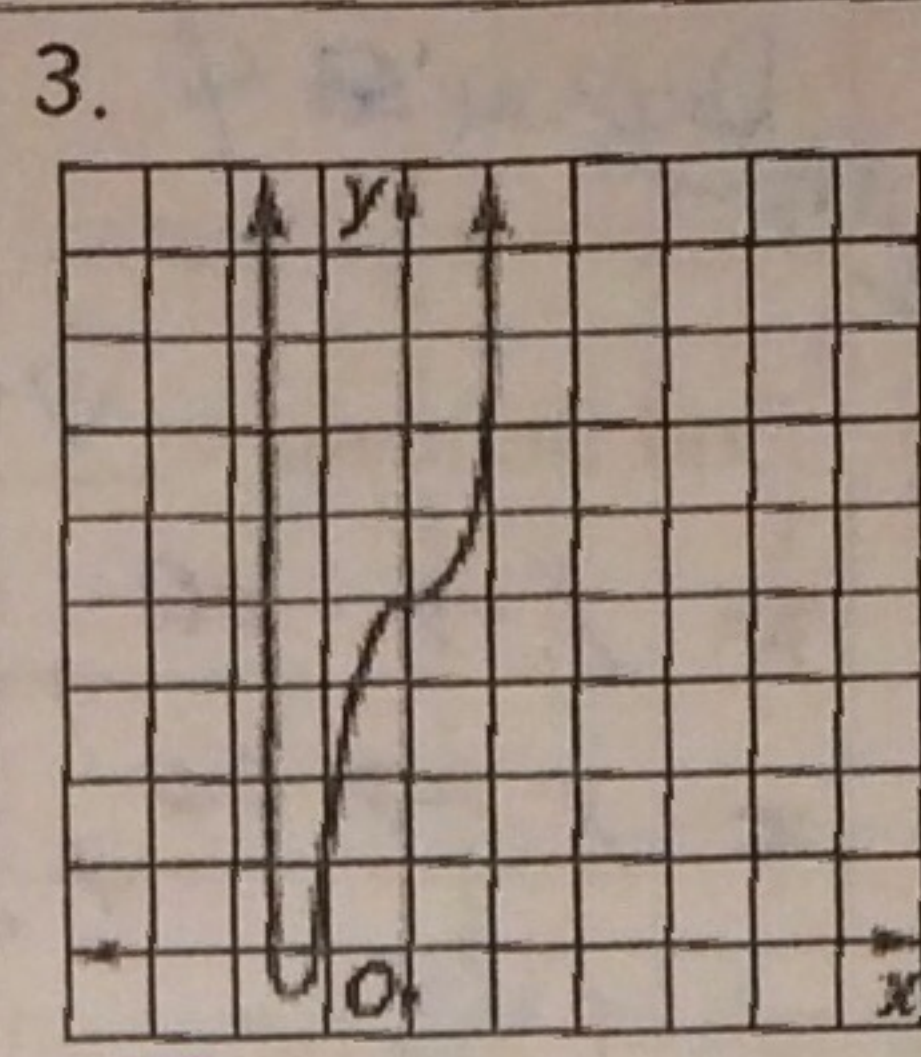


Yes or No  
Why or Why Not?

There is a sharp turn.

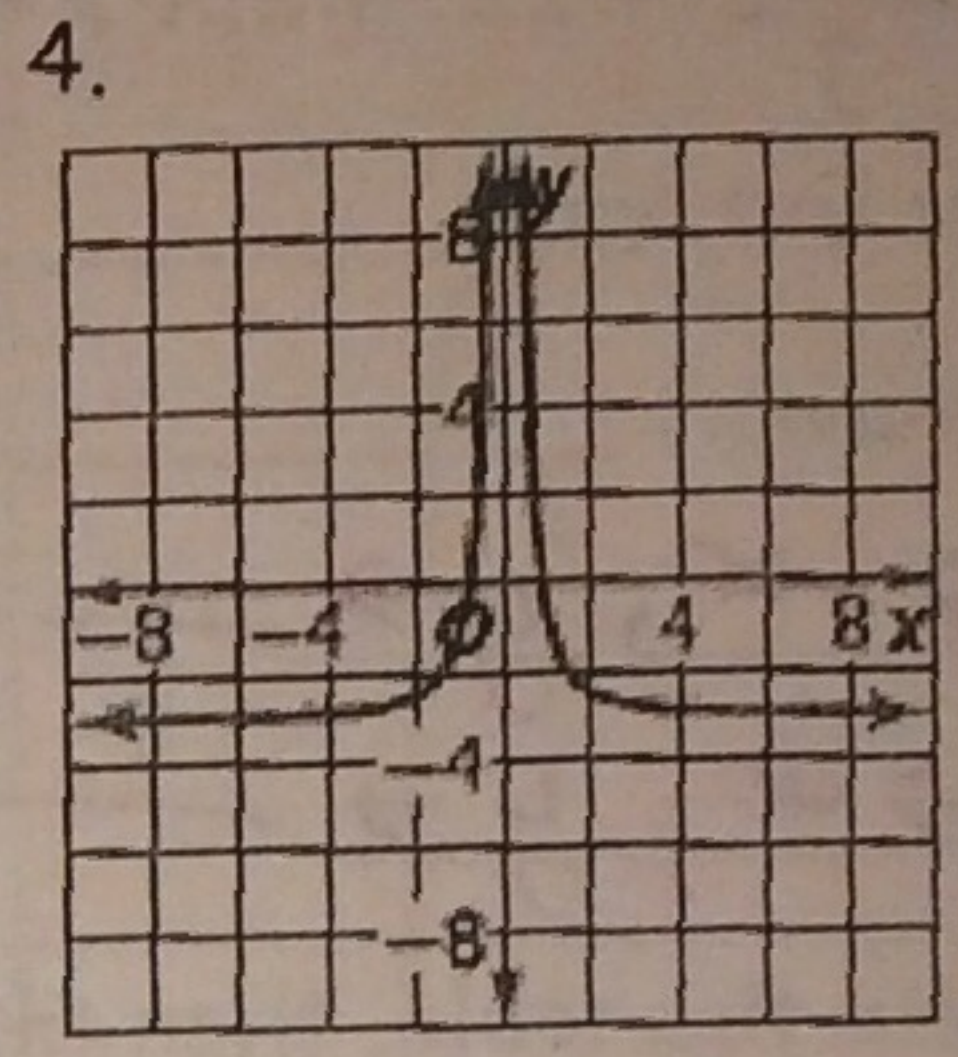


Yes or No  
Why or Why Not?



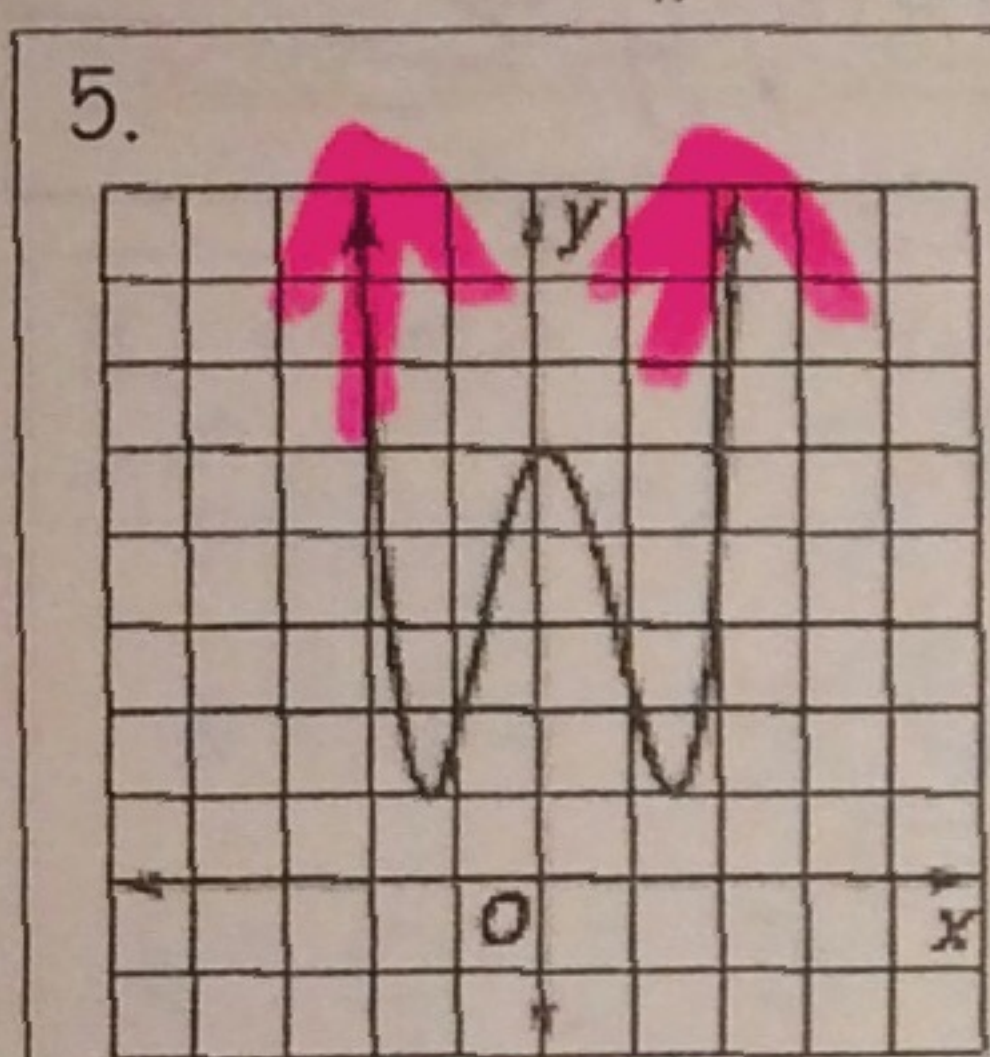
Yes or No  
Why or Why Not?

Continuous and curves



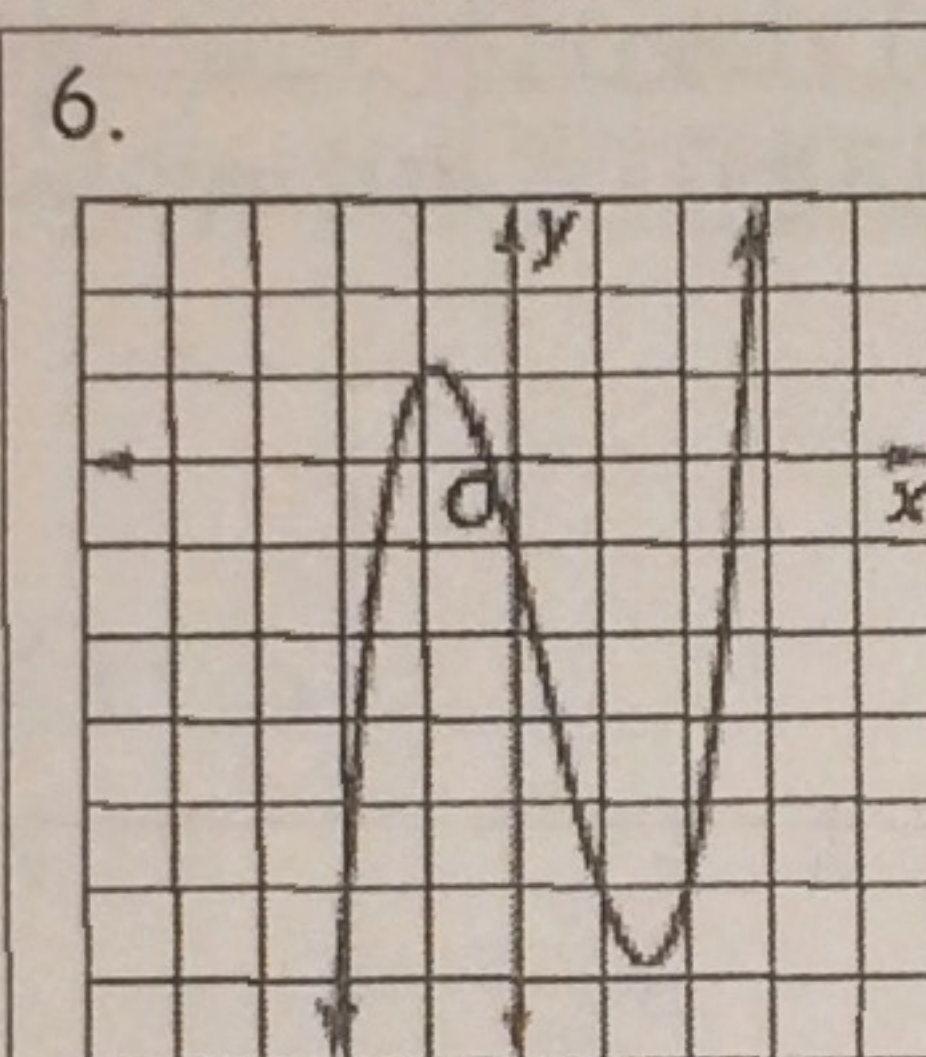
Yes or No  
Why or Why Not?

Determine whether the degree  $n$  of the polynomial for each graph is EVEN or ODD and whether the leading coefficient  $a_n$  is POSITIVE or NEGATIVE.



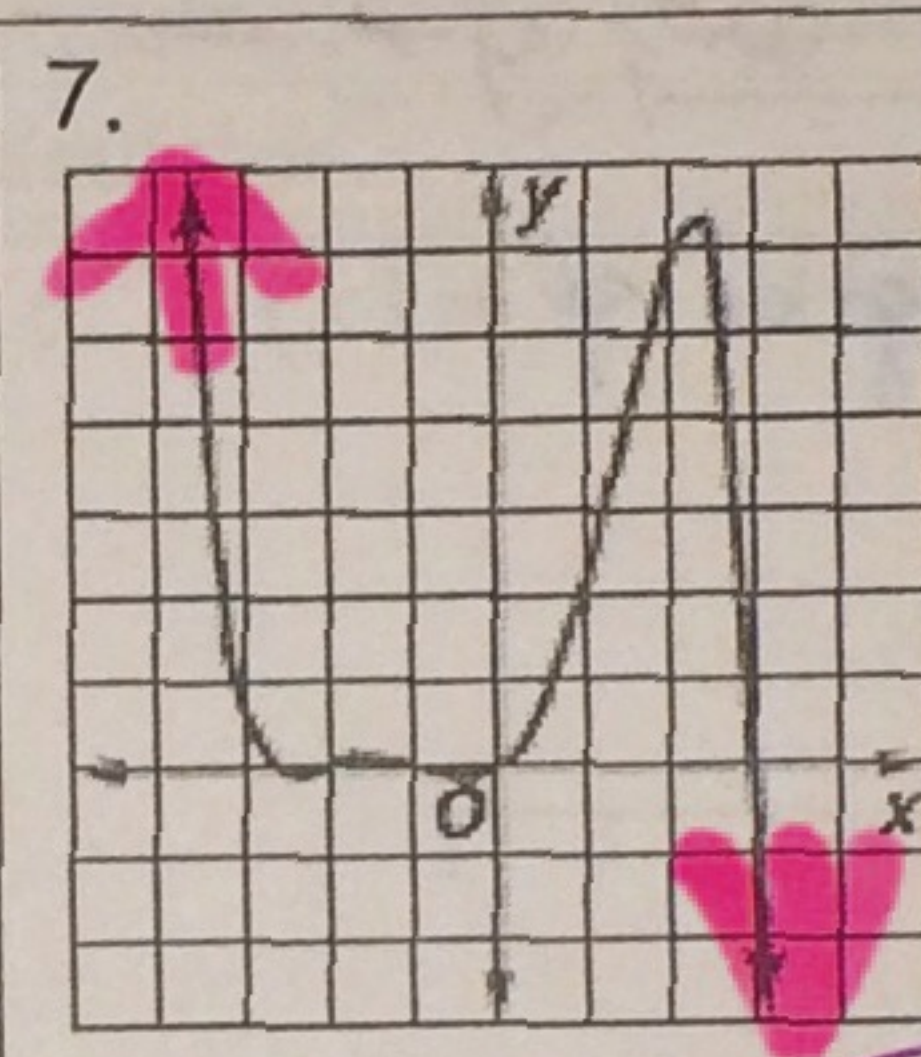
Degree: EVEN or ODD

Leading Coefficient:  
POSITIVE or NEGATIVE



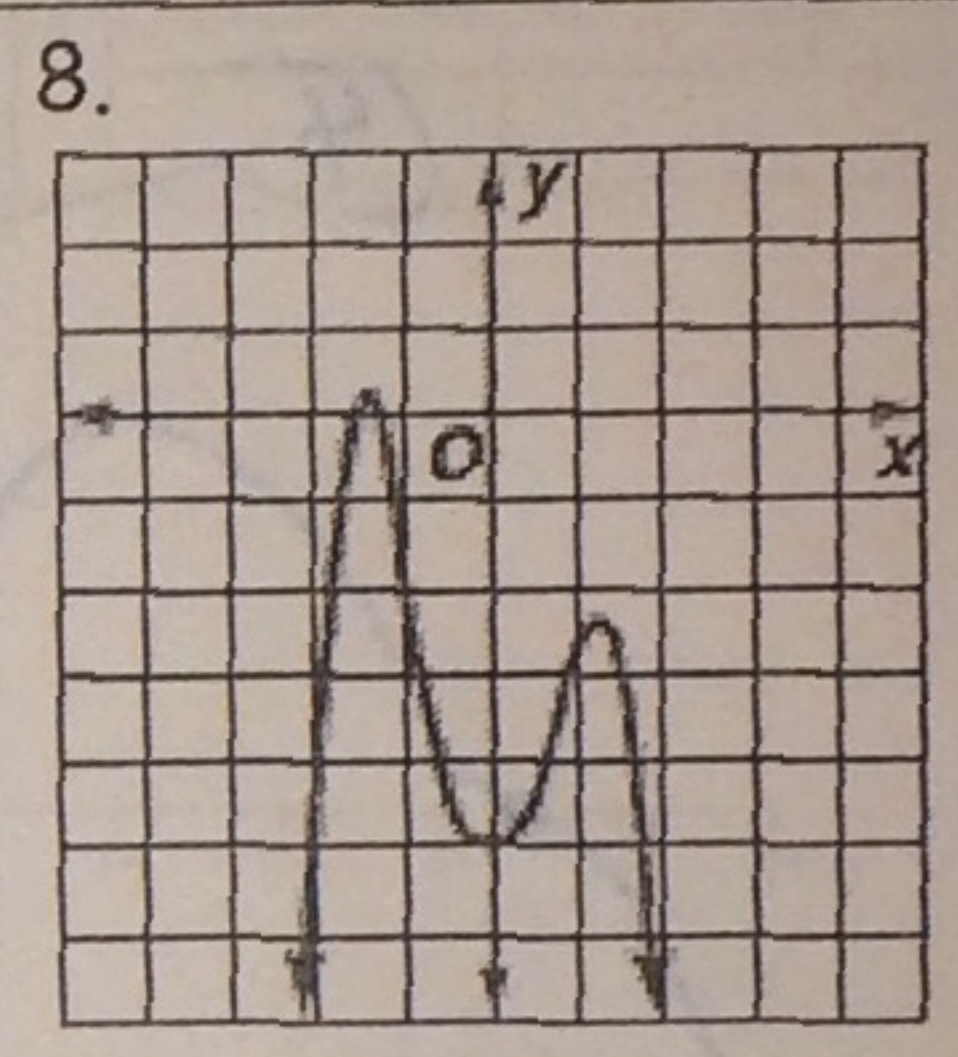
Degree: EVEN or ODD

Leading Coefficient:  
POSITIVE or NEGATIVE



Degree: EVEN or ODD

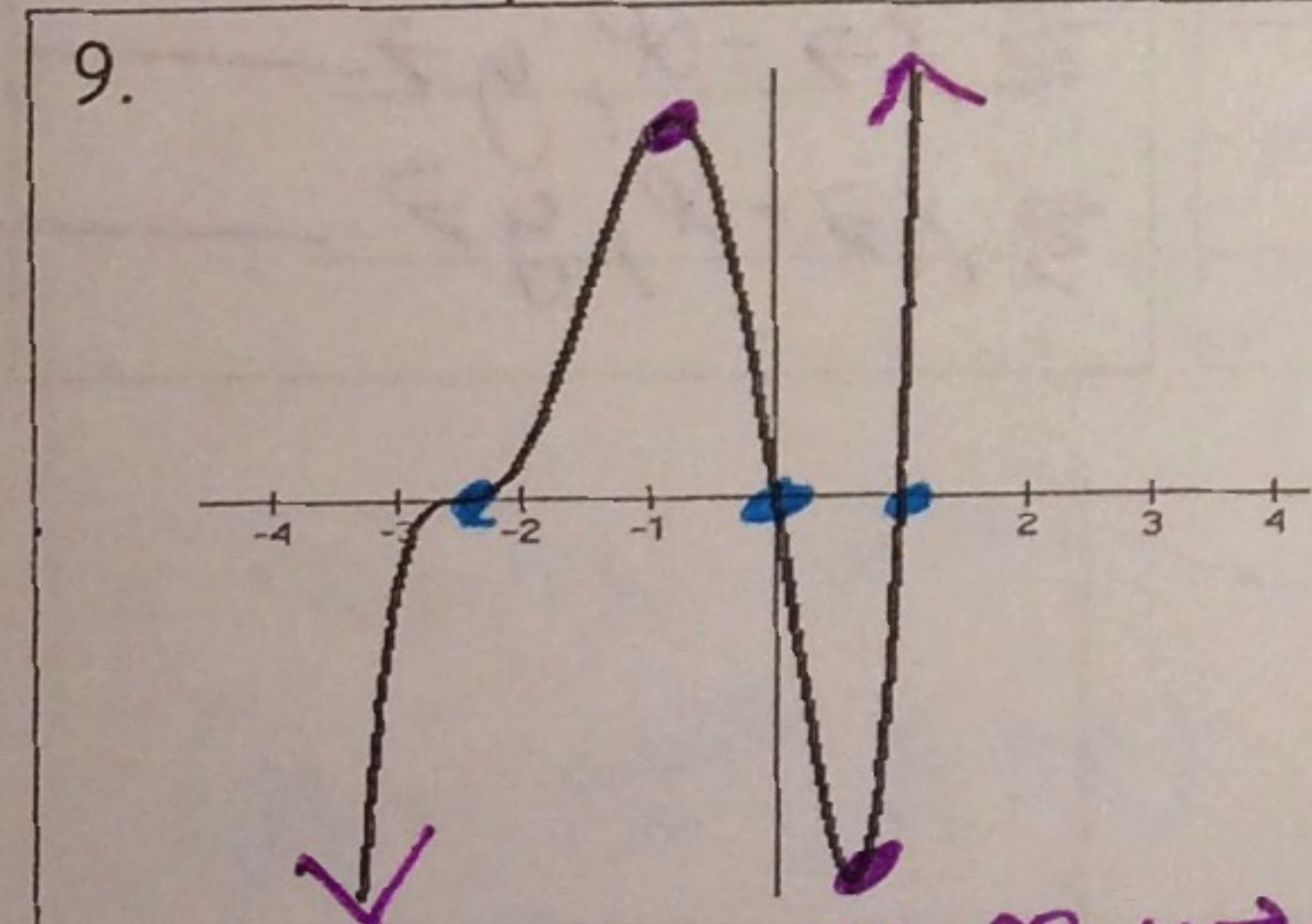
Leading Coefficient:  
POSITIVE or NEGATIVE



Degree: EVEN or ODD

Leading Coefficient:  
POSITIVE or NEGATIVE

Find the requested information for each graph.



End Behavior:  $\downarrow \uparrow$   
 $x \rightarrow -\infty, y \rightarrow -\infty$   
 $x \rightarrow \infty, y \rightarrow \infty$

Even or Odd Degree? Odd

+ or - Leading Coeff.: +

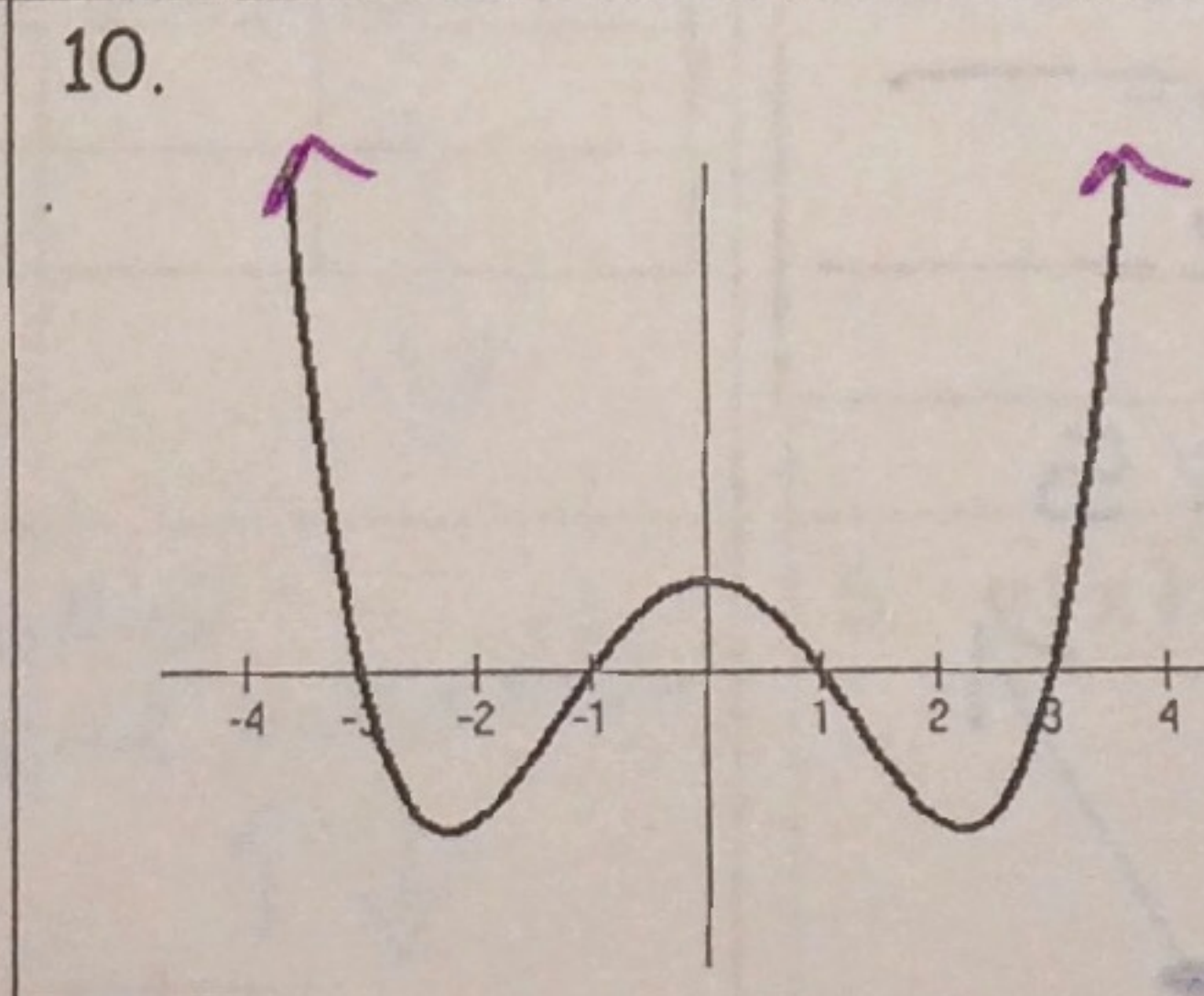
# of relative extrema: 2

Zeros and their Multiplicity:

Factor	Root	Multiplicity
$(2x-5)^3$	$-\frac{5}{2}$	3
$x$	0	1
$(x-1)$	1	1

Possible Function (factored form):

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



End Behavior:  $\uparrow \uparrow$

Even or Odd Degree? \_\_\_\_\_

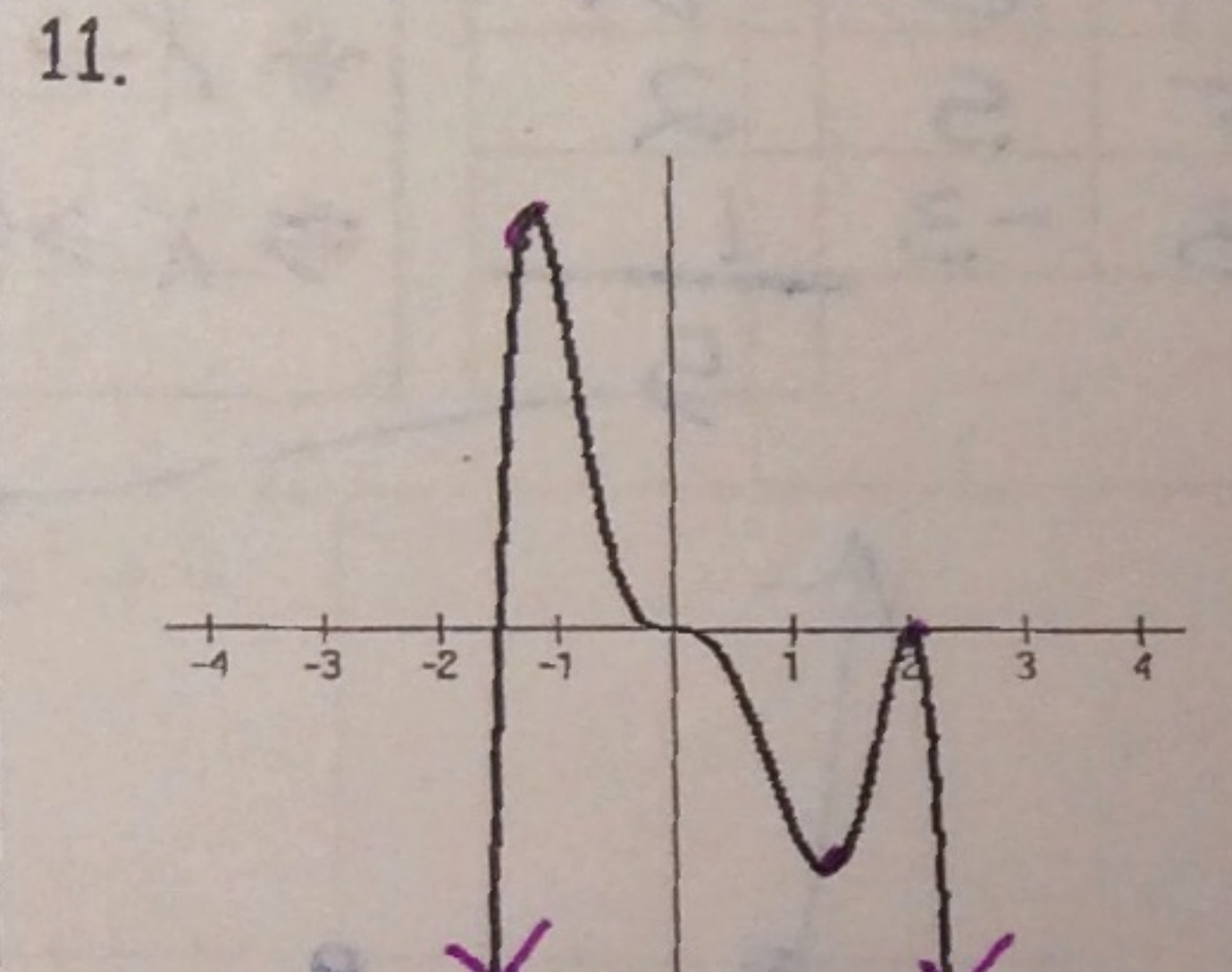
+ or - Leading Coeff.: \_\_\_\_\_

# of relative extrema: \_\_\_\_\_

Zeros and their Multiplicity:

Factor	Root	Multiplicity

Possible Function (factored form):



End Behavior:  $\downarrow \downarrow$   
 $x \rightarrow -\infty, y \rightarrow -\infty$   
 $x \rightarrow \infty, y \rightarrow -\infty$

Even or Odd Degree? Even

+ or - Leading Coeff.: -

# of relative extrema: 3

Zeros and their Multiplicity:

Factor	Root	Multiplicity
$(2x+3)$	$-\frac{3}{2}$	1
$x^3$	0	3
$(x-2)^2$	2	2

Possible Function (factored form):

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

Determine the MAXIMUM possible number of relative extrema for each polynomial function. State the end behavior of the curve as well. **NO CALCULATOR!**

12.  $y = \frac{1}{3}x^5 - 2x^4 + \dots + x - 6$

Relative Extrema: \_\_\_\_\_

End Behavior: \_\_\_\_\_

$x \rightarrow -\infty, y \rightarrow -$

$x \rightarrow \infty, y \rightarrow -$

13.  $y = -5x^4 + 3x^3 + \dots - 2x + 4$

Relative Extrema: 3

End Behavior:  $\downarrow\downarrow$

$x \rightarrow -\infty, y \rightarrow -\infty$

$x \rightarrow \infty, y \rightarrow -\infty$

14.  $y = -2x^{11} + x^{10} + \dots + 5x - 1$

Relative Extrema: \_\_\_\_\_

End Behavior: \_\_\_\_\_

$x \rightarrow -\infty, y \rightarrow -$

$x \rightarrow -\infty, y \rightarrow -$

Complete the table, then Sketch a graph of the function **WITHOUT** using the calculator.

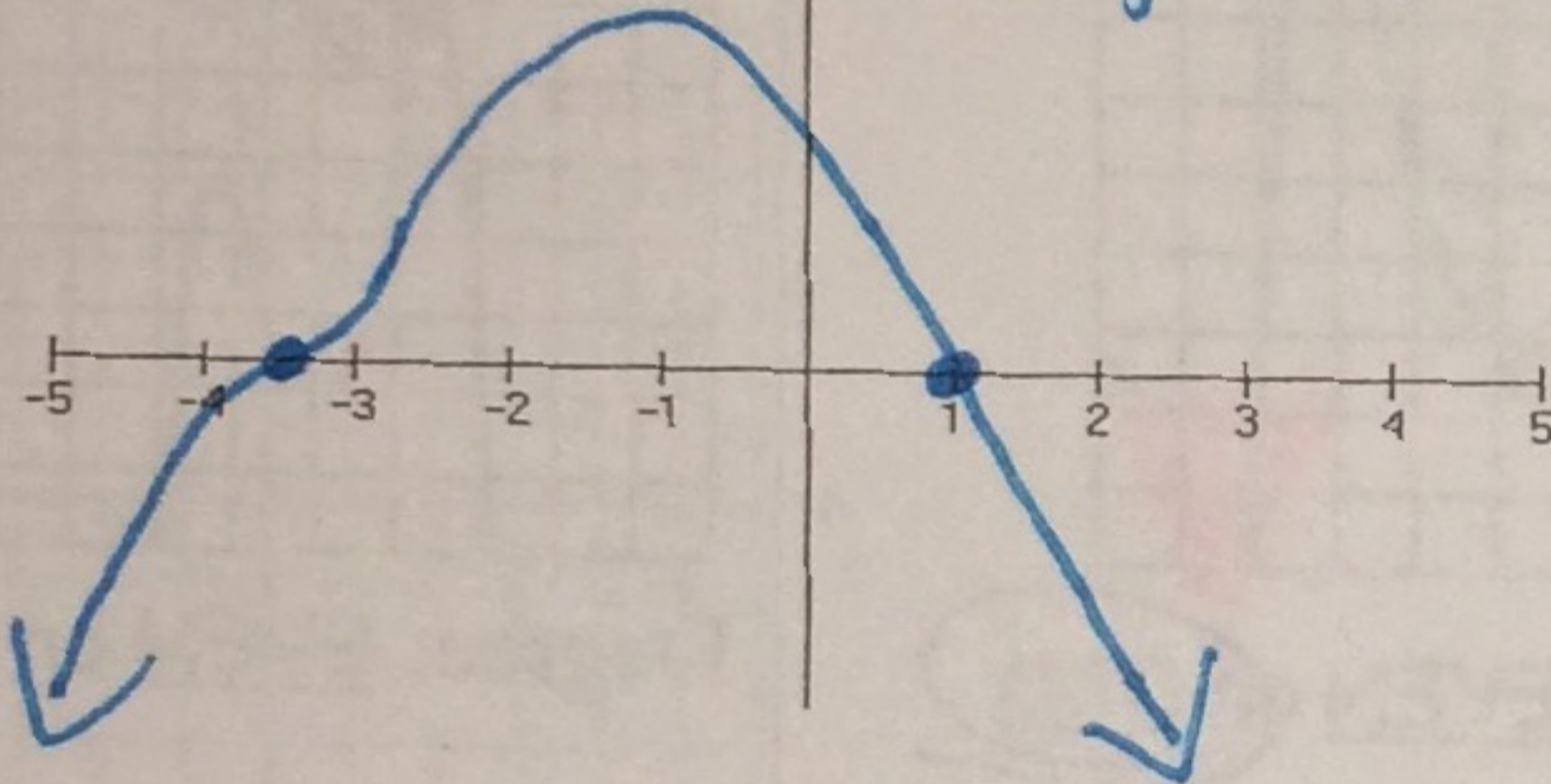
15.  $f(x) = -(2x+7)^3(x-1)$

Factor	Root	Multip.
$2x+7$	$-\frac{7}{2}$	3
$x-1$	1	1

End Behavior:  $\downarrow\downarrow$   
 $x \rightarrow -\infty, y \rightarrow -$   
 $x \rightarrow -\infty, y \rightarrow -$

(4)

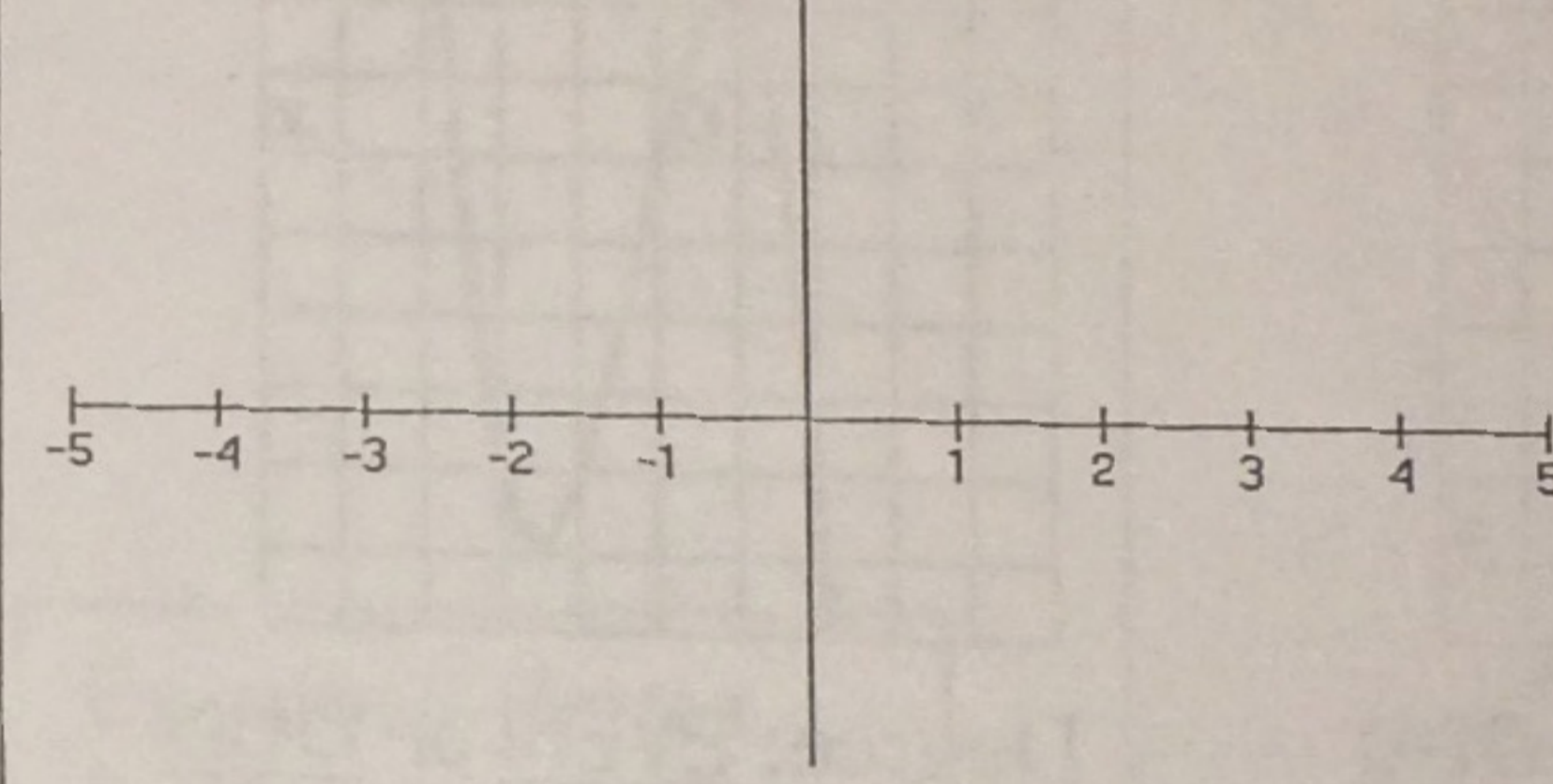
→ Degree 4



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

Factor	Root	Multip.

End Behavior: \_\_\_\_\_  
 $x \rightarrow -\infty, y \rightarrow -$   
 $x \rightarrow -\infty, y \rightarrow -$

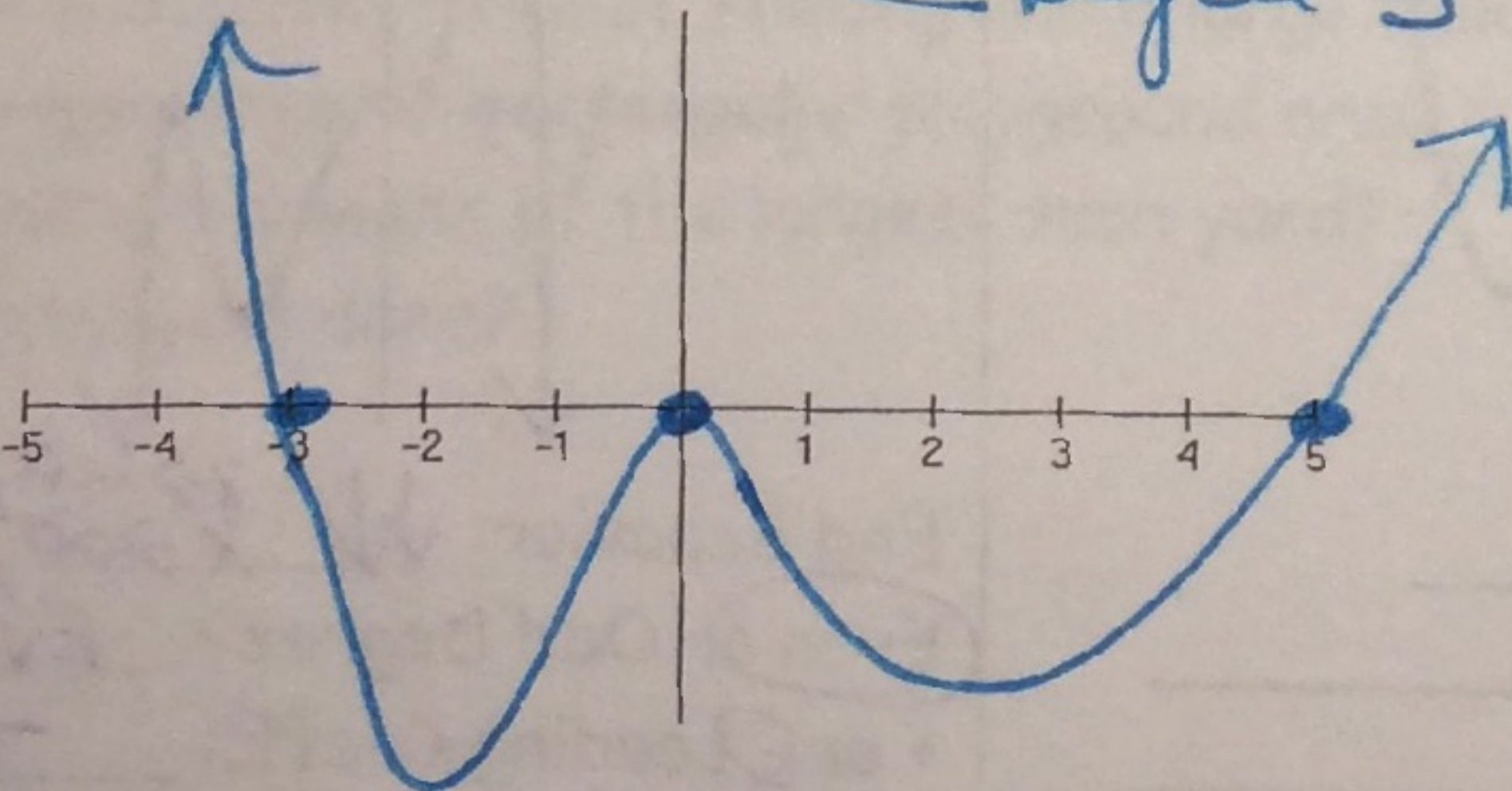


17.  $f(x) = -x^2(x-5)^2(x+3)$

Factor	Root	Multip.
$x^2$	0	2
$x-5$	5	2
$x+3$	-3	1
		5

End Behavior:  $\uparrow\downarrow$   
 $x \rightarrow -\infty, y \rightarrow -$   
 $x \rightarrow \infty, y \rightarrow -$

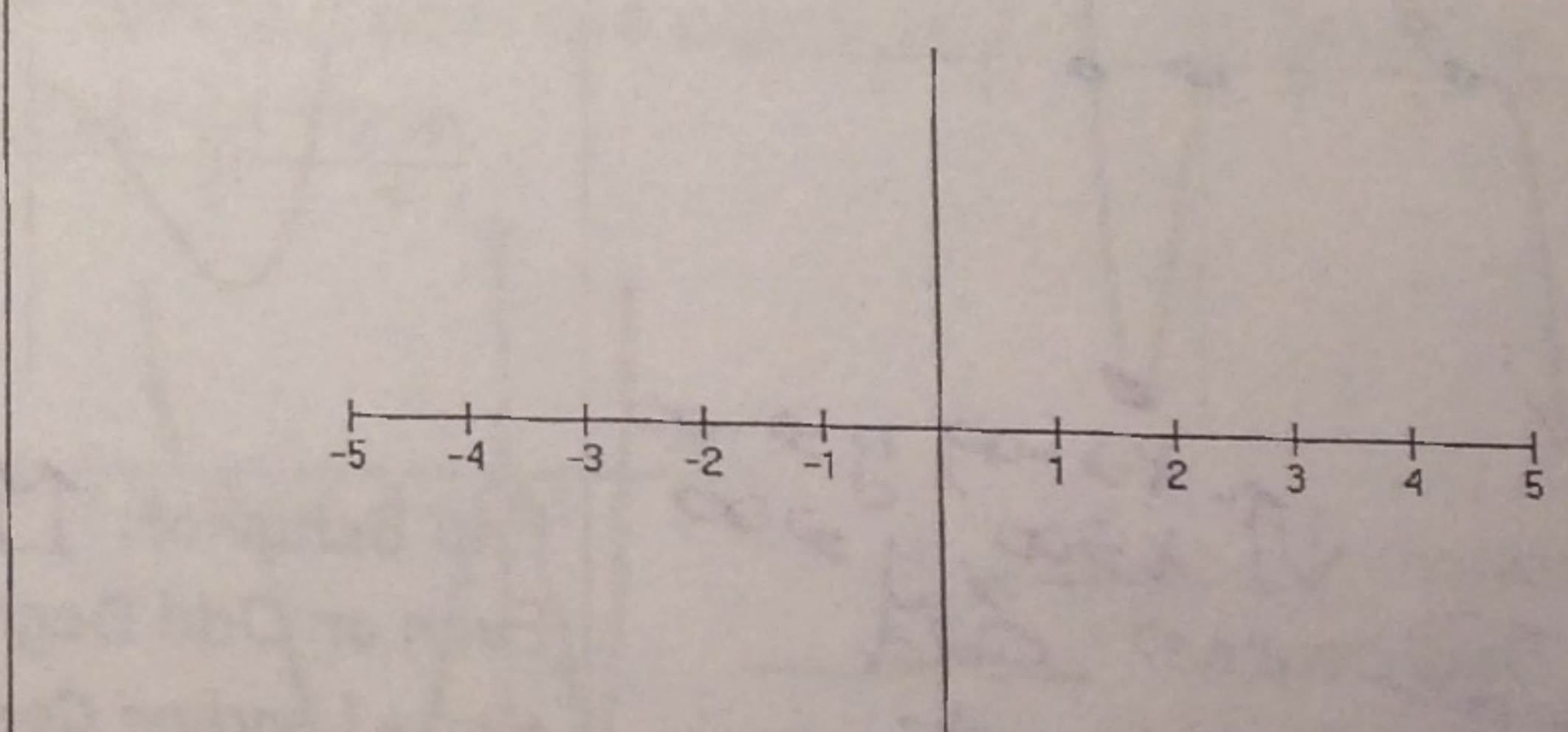
→ Degree 5



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

Factor	Root	Multip.

End Behavior: \_\_\_\_\_  
 $x \rightarrow -\infty, y \rightarrow -$   
 $x \rightarrow -\infty, y \rightarrow -$



State the number of **POSSIBLE** real zeroes. Then determine the all the **REAL ZEROES** by factoring.

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

Possible Real Zeroes: 5

$0 = x^3(x^2 + 3x + 2)$   
 $0 = x^3(x+1)(x+2)$

$x = 0, -1, -2$

+triple

20.  $f(x) = x^4 + 4x^2 - 21$

Possible Real Zeroes: \_\_\_\_\_

21.  $f(x) = -12x^3 + 14x^2 + 6x$

Possible Real Zeroes: 3

$0 = -2x(6x^2 - 7x - 3)$   
 $0 = -2x(2x-3)(3x+1)$

$x = 0, \frac{3}{2}, -\frac{1}{3}$

23.  $f(x) = 9x^6 - 36x^4$

Possible Real Zeroes: \_\_\_\_\_