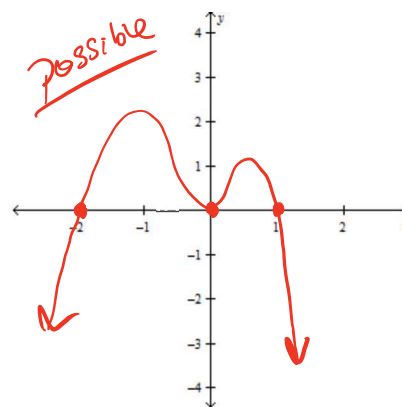


### Homework 3.5

1. On the axes provided at the right, sketch the graph of a polynomial function with the given description.

$G(x)$  has zeros of  $x = 1$ ,  $x = -2$ , and  $x = 0$ , one of which has a multiplicity of 2 while the other two have a multiplicity of 1



Identify the following characteristics of the graph of  $g(x)$  in exercises 2 – 15.

<p><b>Graph of <math>g(x)</math></b></p>	2. Domain of $g(x)$ : $(-\infty, \infty)$	5. What type of function is $g(x)$ ? Give a reason why. $g(x)$ has EVEN degree $\geq 4$ because sum of multiplicities of zeros $\geq 4$ .	
	3. Range of $g(x)$ : $(-\infty, 27]$		6. State the left and right end behaviors of $g(x)$ . $\lim_{x \rightarrow -\infty} g(x) = -\infty$ $\lim_{x \rightarrow \infty} g(x) = -\infty$
	4. Zeros of $g(x)$ and their multiplicity: $x = -3$ , ODD mult $\geq 3$ $x = 1$ , ODD mult = 1		
7. Intervals along the $x$ -axis where $g(x)$ is increasing: $(-\infty, 0)$	8. Intervals along the $x$ -axis where $g(x)$ is decreasing: $(0, \infty)$	9. Relative Maximum(s): The point $(0, 27)$	
10. Relative Minimum(s): None	11. Absolute Maximum(s): The point $(0, 27)$	12. Absolute Minimum(s): None	
13. Approximate $x$ -coordinate of Point(s) of Inflection: Give a reason or show your work for each. ① P <sub>oI</sub> : $x = -3$ b/c $x = -3$ has ODD mult of 3  ② P <sub>oI</sub> $x \approx \frac{-3+0}{2} \approx -3/2$		14. Interval(s) where $g(x)$ is concave up: $(-3, -3/2)$	
		15. Interval(s) where $g(x)$ is concave down: $(-\infty, -3) \cup (-3/2, \infty)$	

Identify the following characteristics of the graph of  $h(x)$  in exercises 16 – 29.

<p style="text-align: center;"><b>Graph of <math>h(x)</math></b></p>	<p>16. Domain of <math>h(x)</math>:</p> <p><math>(-\infty, \infty)</math></p>	<p>19. What type of function is <math>h(x)</math>? Give a reason why.</p> <p><math>h(x)</math> is ODD DEGREE <math>\geq 5</math> bc sum of multiplicities of zeros <math>\geq 5</math></p>
	<p>17. Range of <math>h(x)</math>:</p> <p><math>(-\infty, \infty)</math></p>	
	<p>18. Zeros of <math>h(x)</math> and their multiplicity:</p> <p><math>x = -4</math>, ODD mult <math>\geq 3</math></p> <p><math>x = -1</math>, ODD mult = 1</p> <p><math>x = \frac{1}{2}</math> ODD mult = 1</p>	<p>20. State the left and right end behaviors of <math>h(x)</math>.</p> <p><math>\lim_{x \rightarrow -\infty} h(x) = -\infty</math></p> <p><math>\lim_{x \rightarrow \infty} h(x) = \infty</math></p>
<p>21. Intervals of <math>x</math> – values where <math>h(x)</math> is increasing:</p> <p><math>(-\infty, -2) \cup (0, \infty)</math></p>	<p>23. Relative Maximum(s):</p> <p>Point <math>(-2, 2)</math></p>	
<p>22. Intervals of <math>x</math> – values where <math>h(x)</math> is decreasing:</p> <p><math>(-2, 0)</math></p>		
<p>24. Relative Minimum(s):</p> <p>Point <math>(0, -3)</math></p>	<p>25. Absolute Maximum(s):</p> <p>None</p>	<p>26. Absolute Minimum(s):</p> <p>None</p>
<p>27. Approximate <math>x</math>-coordinate of Point(s) of Inflection: Give a reason or show your work for each.</p> <p>① PoI <math>x = -4</math> b/c <math>x = -4</math> has ODD mult of 3</p> <p>② PoI <math>x \approx \frac{-4 + -2}{2} \approx \frac{-6}{2} \approx -3</math></p> <p>③ PoI <math>x \approx \frac{-2 + 0}{2} \approx \frac{-2}{2} \approx -1</math></p>		<p>28. Interval(s) where <math>h(x)</math> is concave up:</p> <p><math>(-4, -3) \cup (-1, \infty)</math></p>
		<p>29. Interval(s) where <math>h(x)</math> is concave down:</p> <p><math>(-\infty, -4) \cup (-3, -1)</math></p>