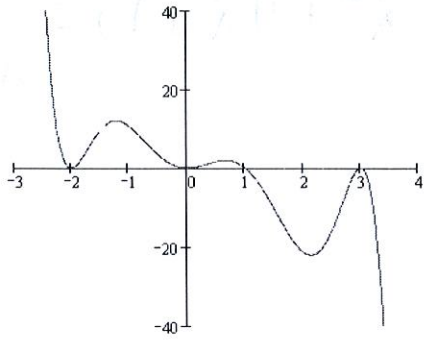
Honors Algebra 2
3.8 - Polynomials

Name _____

Based on the graph, answer the question below:



1. What must the least possible degree be? Give two reasons as to how you know (bullet points).

Least possible degree? 7

- End behavior opposite direction, ODD #.
- 6 extrema → add 1.

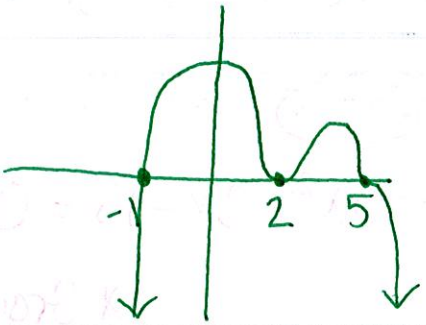
2. What would the range be of a 9th degree polynomial?

odd #

$(-\infty, \infty)$

3. Give an example of a graph that has the following solutions: $x = -1;\ x = 2, 2;$ and $x = 5, 5, 5$

goes through; bounce; goes through (slowly)



(or flipped)

If $f(2) = 3$, $f(-2) = 0$, and $f(0) = 4$, then answer questions 4 - 5

(0,4) is y-int!

4. If we divide by $x - 2$, then what is the remainder?

$2 \overline{)\ 3}$

Remainder 3

5. What is a factor we know?

$f(-2) = 0$

$(x+2)$ factor.

6. **Solve** by factoring $8x^3 - 64 = 0$ SOAP!

$a = 2x \quad b = 4$

or

GCF $8(x^3 - 8)$ $a = x \quad b = 2$

$x = 2, -1 \pm i\sqrt{3}$

7. Find all roots and write them as **linear factors**
$f(x) = x^4 + x^3 + 2x^2 + 4x - 8$

table: $-2, 1$

$(x+2)(x-1)(x+2i)(x-2i)$

8. Find all **x-intercepts** $f(x) = x^4 + 4x^3 + x^2$

$x^2(x^2 + 4x + 1)$ ← Quadratic

$(0,0)(0,0)(-2+\sqrt{3}, 0)(-2-\sqrt{3}, 0)$

9. Find all **roots** $f(x) = x^3 + 6x^2 - 6x - 1$

table: 1

$x = 1, \frac{7}{2} \pm \frac{3\sqrt{5}}{2}$

10. Find all the **solutions** $x^3 - 5x^2 = -3x + 15$

$x^3 - 5x^2 + 3x - 15 = 0$

* Grouping
or
* Table : 5

$x = 5, \pm i\sqrt{3}$