Intermediate Algebra B   Name __Key__

Unit 6: Cubic Functions Re-Teach   Hour 1 2 3 4 5

> *I can graph polynomial functions and demonstrate understanding of the significant features of its graph and their relationship to real-world solutions.*

NO CALCULATOR!!!

1. Sketch the end behavior of the following polynomial functions:

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

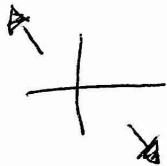   b. $f(x) = 3x^3 + 2x - 1$

    c. $f(x) = (x + 1)^2(x + 2)^3$

2. Identify the significant features of the polynomial function and use them to sketch the graph:
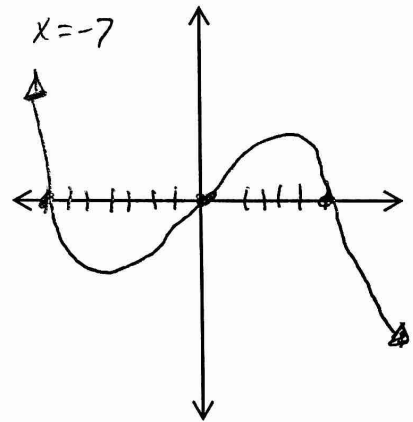
$$f(x) = -x(x - 5)(x + 7)$$

a. End Behavior sketch:

$f(x) =$ $-x = 0$ $x - 5 = 0$ $x + 7 = 0$

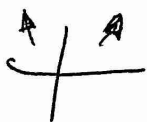$x = 0$ $x = 5$ $x = -7$

b. x-intercepts and their multiplicity:

$(0, 0) \rightarrow 1$
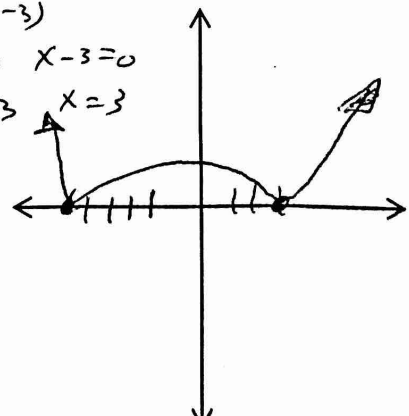
$(5, 0) \rightarrow 1$

$(-7, 0) \rightarrow 1$

3. Identify the significant features of the polynomial function and use them to sketch the graph:

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

a. End Behavior sketch:

$(x + 5) (x + 5)$ $(x - 3)(x - 3)$

$x + 5 = 0$ $x + 5 = 0$ $x - 3 = 0$ $x - 3 = 0$
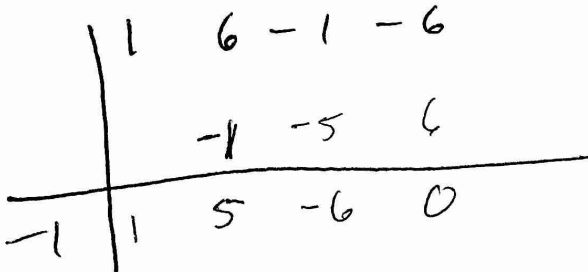
$x = -5$ $x = -5$ $x = 3$ $x = 3$
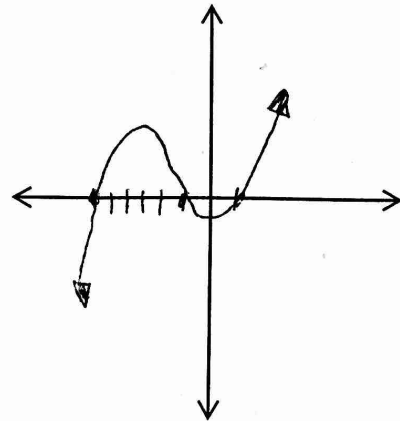
b. x-intercepts and their multiplicity:

$(-5, 0) \Rightarrow 2$

$(3, 0) \Rightarrow 2$

4. Sketch a graph of the following polynomial:

$$f(x) = x^3 + 6x^2 - x - 6 \text{ given that } x = -1 \text{ is a zero}$$

$$
\begin{array}{c|cccc}
 & 1 & 6 & -1 & -6 \\
 & & -1 & -5 & 6 \\
\hline
-1 & 1 & 5 & -6 & 0 \\
\end{array}
$$

$$x^2 + 5x - 6$$

$$(x + 6)(x - 1)$$

5. Sketch a graph that meets the following requirements:
   • Roots at x = -7 and 3
   • Both roots have a multiplicity of 2
   • Positive leading coefficient