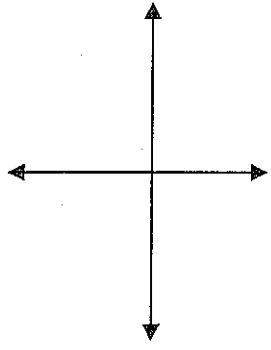
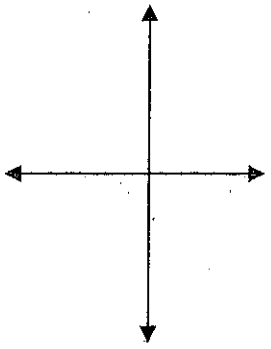
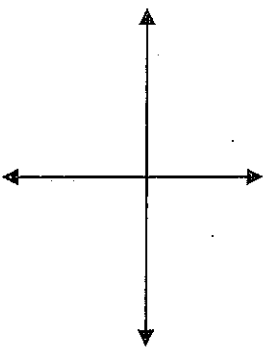
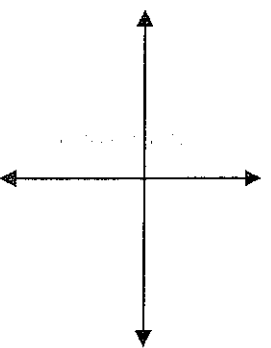


Polynomial Functions and Their Graphs (Patterns of Polynomials) Worksheet

Name: _____

Fill out this table. Sketch the graph of this function using the critical points.

Function	$f(x) = \frac{1}{2}(x - 2)(x + 4)$	$f(x) = \frac{1}{2}(x - 2)^2(x + 3)$	$f(x) = -\frac{1}{2}(x + 2)(x + 1)(x - 3)$	$f(x) = -\frac{1}{2}(x - 2)^2(x + 2)(x + 4)$
Leading Coefficient				
Degree				
Number of Linear Factors				
End Behavior	(__ , __)	(__ , __)	(__ , __)	(__ , __)
Number of Turning Points				
y-intercept				
Number of Real Zeros	Crossing: Touching: Total:	Crossing: Touching: Total:	Crossing: Touching: Total:	Crossing: Touching: Total:
Sketch of Graph				

Polynomial Functions & their Graphs WITHOUT a Graphing Calculator

Name: _____

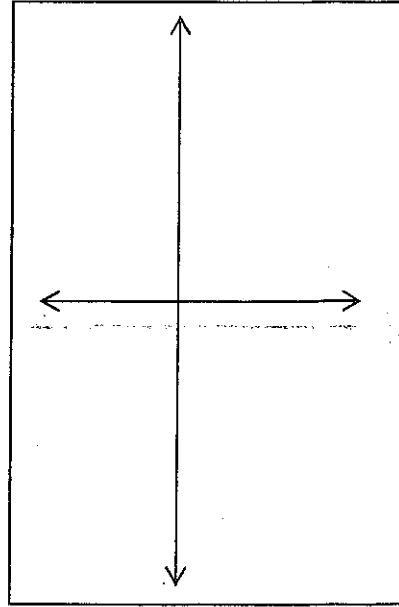
Summary of Conjectures from the Graphing Calculator Activity:

- The maximum possible number of turning points is one less than the degree of the polynomial.
- The maximum possible number of zeros of a polynomial is the same as its degree.
- The graph of a polynomial will touch, but not cross, the x-axis at zeros of even multiplicity.
- The graph of the polynomial will cross the x-axis at zeros of odd multiplicity.

Directions: Complete each of the following WITHOUT a graphing calculator. Sketch a *general* graph of the function. Be sure to include the x-intercepts and y-intercept on this graph!

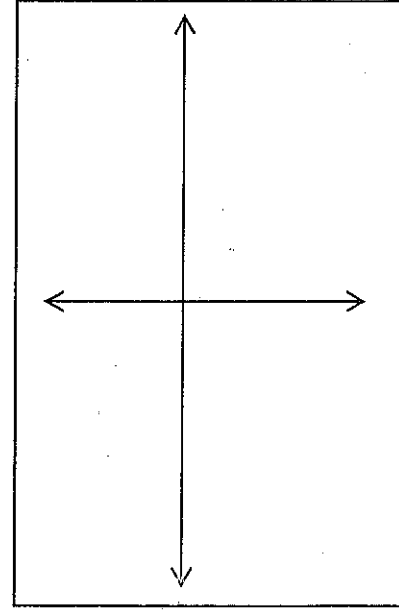
1) $f(x) = -2(x + 2)(x - 5)^2$

- a. Leading Coefficient: $a =$ _____
b. Degree: _____
c. End Behavior (_____, _____)
d. Cross: _____ Touch: _____ Total: _____
e. y-intercept: _____
f. Max number of Turning Points: _____
g. Sketch the graph of the function.



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

- a. Leading Coefficient: $a =$ _____
b. Degree: _____
c. End Behavior (_____, _____)
d. Cross: _____ Touch: _____ Total: _____
e. y-intercept: _____
f. Max number of Turning Points: _____
g. Sketch the graph of the function.



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

- a. Leading Coefficient: $a =$ _____
b. Degree: _____
c. End Behavior (_____, _____)
d. Cross: _____ Touch: _____ Total: _____
e. y-intercept: _____
f. Max number of Turning Points: _____
g. Sketch the graph of the function.

