

Graphing Polynomial Functions — Part D: Interpreting Graphs and Writing Equations

Answer each question using end behavior, zeros, and multiplicity.

Name: _____

Date: _____

Period: _____

1. A polynomial has degree 5 and a negative leading coefficient. State its end behavior, the maximum number of x-intercepts, and the maximum number of turning points.

2. Write a possible equation for a degree-3 polynomial with a positive leading coefficient whose zeros are $x = -2$ (multiplicity 1) and $x = 1$ (multiplicity 2).

3. A graph crosses the x-axis at $x = -2$ and $x = 3$, touches the x-axis at $x = 1$, and both ends point up. Find the least possible degree and write one possible equation.

4. Match each function to its end behavior (both up, both down, down then up, or up then down): (a) $4x^4 - x^2$; (b) $-3x^3 + x$; (c) $2x^5 - 7$; (d) $-x^6 + 5x^2$.

5. A cubic polynomial has zeros at $x = -3$, $x = 0$, and $x = 2$, and its graph passes through the point $(1, -6)$. Find its equation.

6. Can a degree-4 polynomial have exactly three distinct real zeros? Explain, and give an example in factored form if it is possible.