

Purpose: In this problem set, you will review and practice graphing polynomials by analyzing formulas and practice finding possible formulas for a given graph.

1. For each function below, describe the end behavior.

(a) $f(x) = x^2 + 4x + 3$

(b) $g(x) = -x^3 + 9x^2 - 24x - 1$

(c) $h(x) = x^3 + 3$

(d) $P(x) = x^4 + x^3 + 1$

(e) $Q(x) = -x^2 + 1$

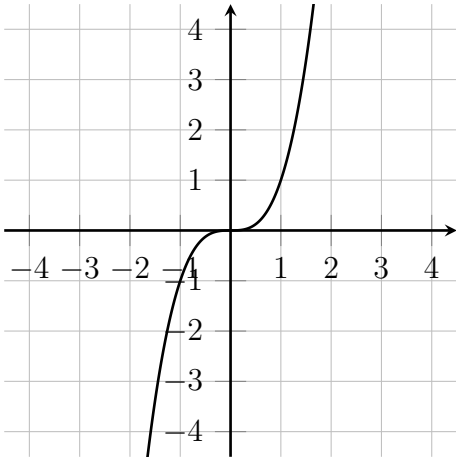
2. Find the zeros of the polynomials below and their multiplicities.

(a) $f(x) = -2(x - 1)(x + 2)^2(x + 5)^3$

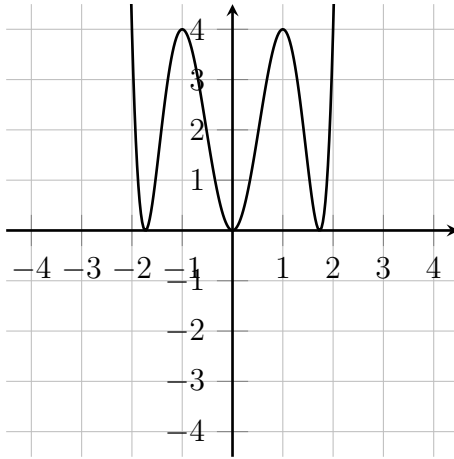
(b) $g(x) = x^2 - 3x + 2$

(c) $h(x) = (3x + 5)(x - 3)$

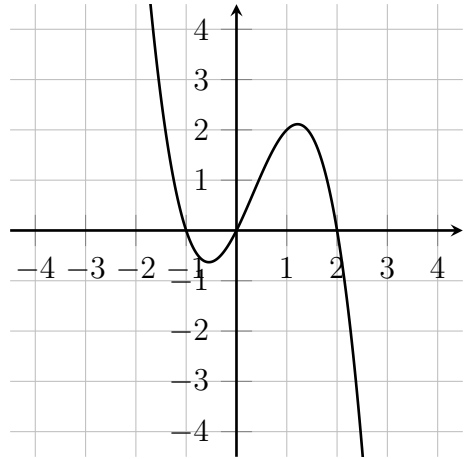
3. Match the functions with their graphs.



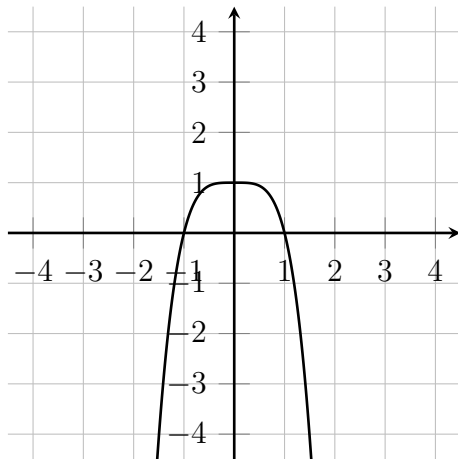
A



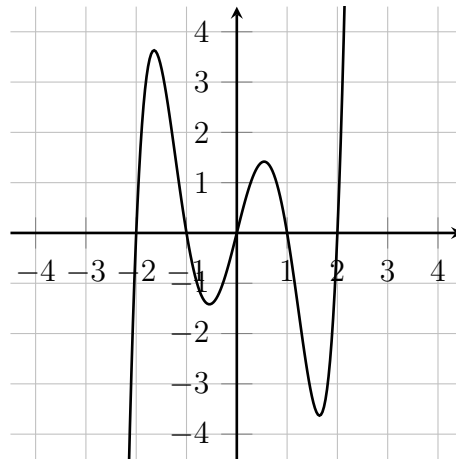
B



C



D



E

_____ $f(x) = -x^4 + 1$

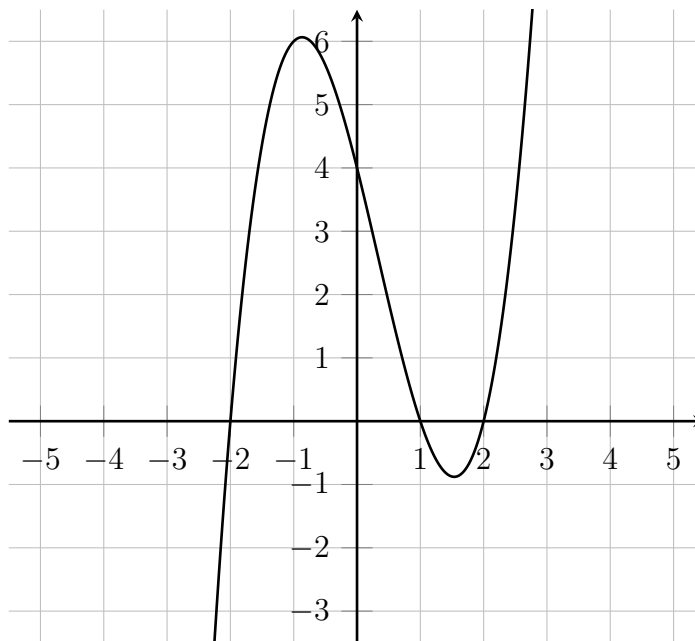
_____ $f(x) = x^5 - 5x^3 + 4x$

_____ $f(x) = x^3$

_____ $f(x) = x^6 - 6x^4 + 9x^2$

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

4. Consider the polynomial $f(x) = (x^2 - 4)(x - 1)$.



- (a) Find the roots and the y -intercept of the polynomial. Label these on the graph.
- (b) Describe the end behavior of the polynomial. Identify these on the graph.
- (c) Does the polynomial have any local extrema? Identify them on the graph above and classify each as a maximum or minimum.
- (d) Using the graph above, estimate the intervals of increase and decrease. Label these on the graph.

5. Sketch the graph of $f(x) = x^4 + x^3$.

