

5.REV.3 ~ POLYNOMIAL FUNCTIONS

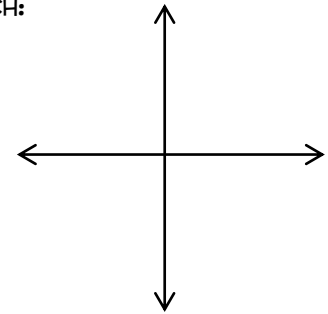
Analyze each polynomial function for its long-run and short-run behavior. Sketch its graph of by hand.

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

LEADING TERM:

x-INTERCEPTS:

SKETCH:



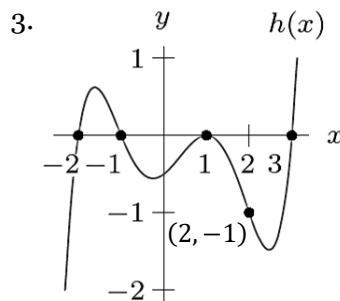
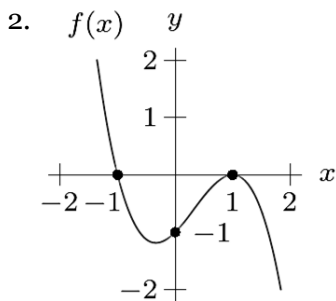
END BEHAVIOR:

ZERO MULTIPLICITY CROSS OR TOUCH

$\lim_{x \rightarrow -\infty} f(x) =$ $\lim_{x \rightarrow \infty} f(x) =$

y-INTERCEPT:

Find a possible function formula for the polynomial whose graph is shown.



Factor the polynomial function completely.

4. $L(x) = x^3 + 2x^2 - 9x - 18$

5. $y(x) = 8x^3 + 125$

6. $n(x) = 3x^4 - 2x^2 - 5$

7. $O(x) = 9x^2 + 5x - 4$

8. $M(x) = 3x^3 - 2x^2 - 6x + 4$

9. $a(x) = 7x^4 + 34x^2 - 5$

Problems 10 & 11: First use synthetic division to write the polynomial in its factored form. Then find the zeros. Use the Quadratic Formula, if necessary, and round to 2 decimal places.

10. $f(x) = 2x^3 + x^2 - 13x + 6$; 2 is a zero

11. $f(x) = 2x^3 - 7x^2 - 12x + 20$; -2 is a zero

Problems 12 & 13: Analyze each polynomial function for its long-run and short-run behavior. Use the appropriate method: factoring (if necessary) and the Zero Product Property, the Square Root Property, or the Quadratic Formula, to find the x -intercepts/zeros of the polynomial function. *If necessary, round to 2 decimal places.*

12. $f(x) = 8x^3 - 4x^2 - 60x$

Factor completely and determine the zeros of f .

LEADING TERM: _____

y -INTERCEPT: _____

ZEROS:

$$\lim_{x \rightarrow -\infty} f(x) = \underline{\hspace{2cm}}$$

$$\lim_{x \rightarrow \infty} f(x) = \underline{\hspace{2cm}}$$

13. $f(x) = (4x^2 - 5)(x^2 - 2x - 5)$

Use the appropriate methods to find the zeros of f .

LEADING TERM: _____

y -INTERCEPT: _____

ZEROS:

$$\lim_{x \rightarrow -\infty} f(x) = \underline{\hspace{2cm}}$$

$$\lim_{x \rightarrow \infty} f(x) = \underline{\hspace{2cm}}$$