

🍷 Self-Test for Chapter 4 🍷

1. Graph a polynomial function. Label all intercepts ; the end behavior.

a. $P(x) = x^4 - 2x^3 - 15x^2$.

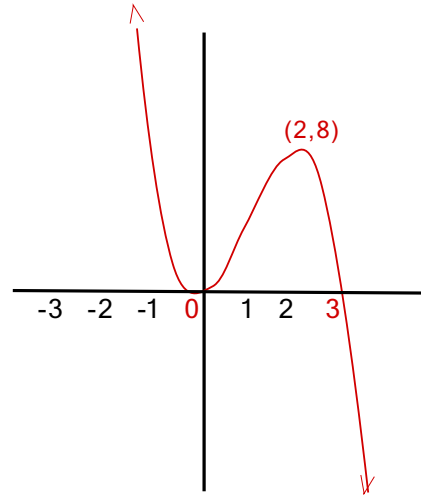
b. $P(x) = x^5 - 5x^3 + 4x$.

2. Use polynomial long division.

EG: Divide ... $\frac{6x^4 + 2x^2 + 22x}{2x^2 + 5}$

3. Construct a polynomial to specifications!

- a. Find a polynomial whose graph is like that shown.
- b. Find a second-degree polynomial with real coefficients, with roots -3 and 2, passing through (4,3).
- c. Find a polynomial of minimal degree, with real coefficients, having roots $2i$ and $1 - i$, and constant term 16.



4. Find all the zeros of a polynomial function.

- a. For $P(x) = 5x^3 - 22x^2 + 18x - 4$, list all the theoretically possible rational zeroes of P ; use synthetic division to locate a root; then find the remaining roots.
- b. Find all the roots of $P(x) = 4x^5 + 15x^3 - 4x$

5. Graph a rational function. Include the following:

- Find the x and y intercepts.
- Find the equation of any vertical asymptote.
- Find the equation of any horizontal asymptote.
- Sketch the graph.

a. $f(x) = \frac{3x - 4}{x - 2}$

b. $f(x) = \frac{x^2 - 3x - 4}{x - 2}$

c. $f(x) = \frac{x^3 - 1}{x}$

6. Miscellaneous:

- a. Find the value of $P(x) = 2x^5 - 20x^4 - 20x^3 - 20x^2 - 20x - 22$ without raising 11 to a power.
- b. If $P(x) = (x - 2)(x^3 - 4x^2 + 7x + 13) + 7$, what is $P(2)$?