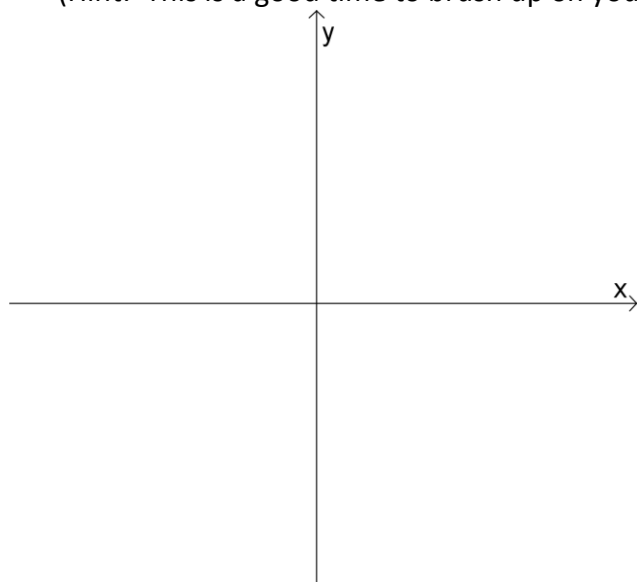


1. Sketch the graph of $f(x) = x^3 - 2x^2 - 4x + 8$. Be sure to show intercepts, test points (before smallest x -intercept, between x -intercepts, and after largest x -intercept), and end behavior. (Hint: This is a good time to brush up on your factor by grouping skills. 😊)



Q: What can you catch, but not throw?

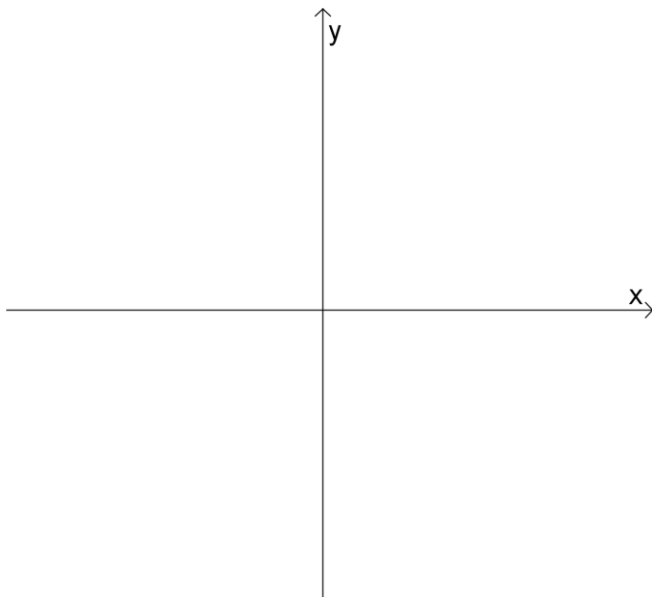
2. Let $f(x) = x^3 - x^2 - 6x$.

a) Find the x -intercept(s) and the y -intercept of $f(x)$.

b) Find a test point between the x -intercepts of $f(x)$, as well as a test point before the first x -intercept, and a test point after the last x -intercept.

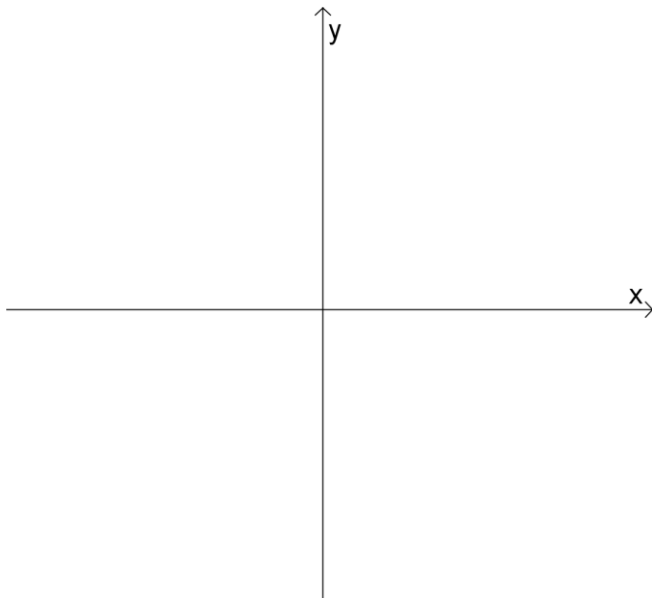
c) Determine the end behavior of $f(x)$.

d) Sketch the graph of $f(x)$.



3. Let $f(x) = -\frac{1}{2}(x-1)^2(x+2)^2$.

- a) Find the x -intercept(s) and the y -intercept of $f(x)$.
- b) Find a test point between the x -intercepts of $f(x)$, as well as a test point before the first x -intercept, and a test point after the last x -intercept.
- c) Determine the end behavior of $f(x)$.
- d) Sketch the graph of $f(x)$.



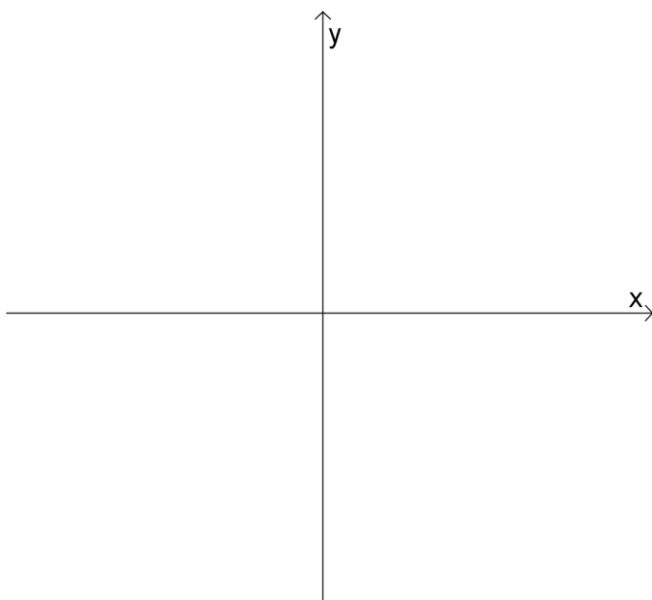
4. Let $f(x) = -2x^4 - x^3 + 3x^2$.

a) Find the x -intercept(s) and the y -intercept of $f(x)$.

b) Find a test point between the x -intercepts of $f(x)$, as well as a test point before the first x -intercept, and a test point after the last x -intercept.

c) Determine the end behavior of $f(x)$.

d) Sketch the graph of $f(x)$.



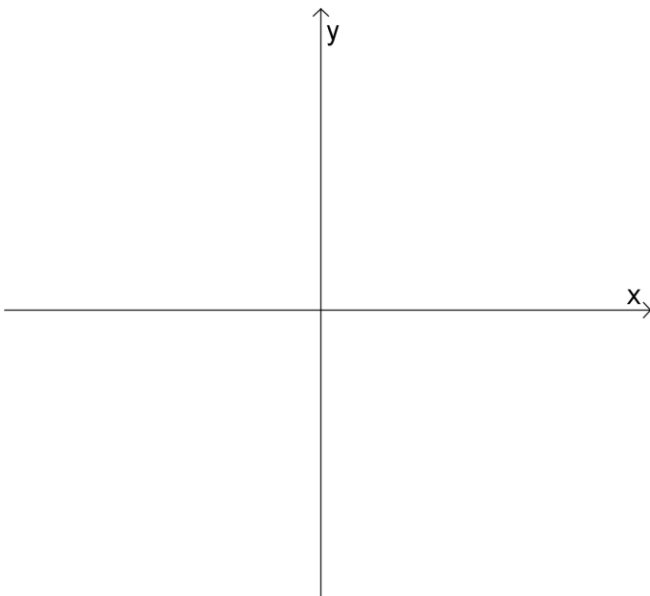
5. Let $f(x) = 2x^3 - x^2 - 8x + 4$.

a) Find the x -intercept(s) and the y -intercept of $f(x)$.

b) Find a test point between the x -intercepts of $f(x)$, as well as a test point before the first x -intercept, and a test point after the last x -intercept.

c) Determine the end behavior of $f(x)$.

d) Sketch the graph of $f(x)$.



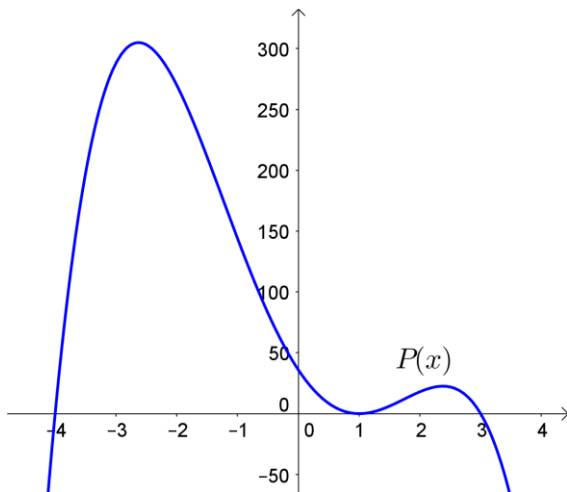
6. The graph of $P(x)$ is shown below.

a) Find the zeros of $P(x)$, and for each zero determine if the multiplicity is even or odd.

b) How many turning points does $P(x)$ have?

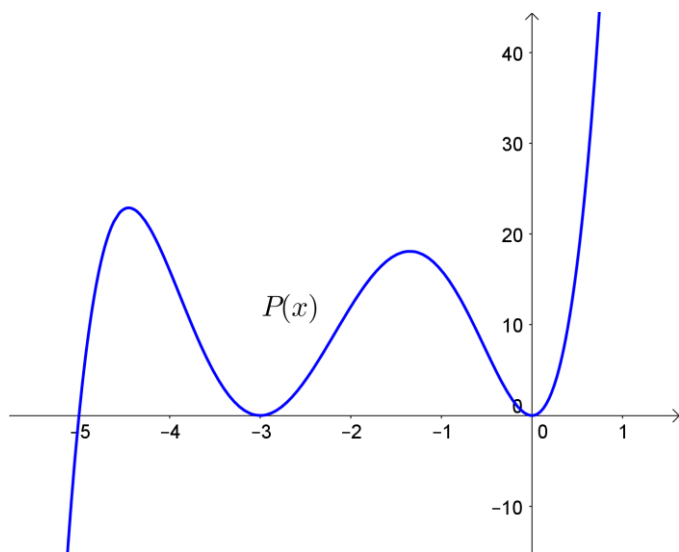
c) What is the smallest possible degree of $P(x)$?

d) Determine the end behavior of $P(x)$.



7. The graph of $P(x)$ is shown below.

- Find the zeros of $P(x)$, and for each zero determine if the multiplicity is even or odd.
- How many turning points does $P(x)$ have?
- What is the smallest possible degree of $P(x)$?
- Determine the end behavior of $P(x)$.



Optional exercises from the Sullivan book if you'd like more practice:
4.1 (p.184) #57-67 (parts a, b, and d only), 81-97 odd (find intercepts, test points, end behavior, and graph)