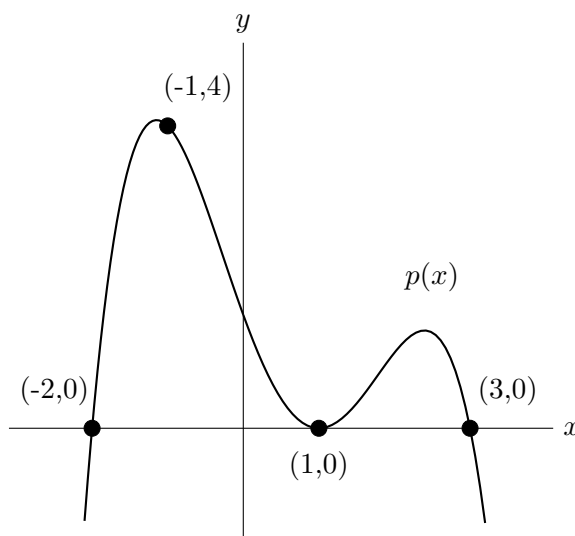


4. [7 points] Find a possible formula for the polynomial  $p(x)$  whose graph is shown below. Show your work in the open space below the blank.



$$p(x) = \underline{-0.25(x+2)(x-1)^2(x-3)} .$$

*Solution:* The function has zeros at  $x = -2, 1, 3$ , and appears to have an even repeated root at  $x = 1$ . We can tell because the function looks like the vertex of a parabola (or possibly a higher order power function with even positive exponent) near the point  $(1, 0)$ . This means a possible formula is

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

for some constant  $a$  (which should be negative based on the end behavior of the function). To find out what  $a$  is, we use the fourth point  $(-1, 4)$  in our equation:

$$4 = a(-1+2)(-1-1)^2(-1-3).$$

This gives us  $a = -0.25$ .