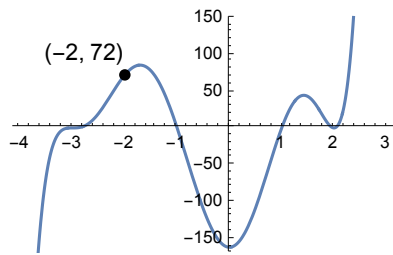


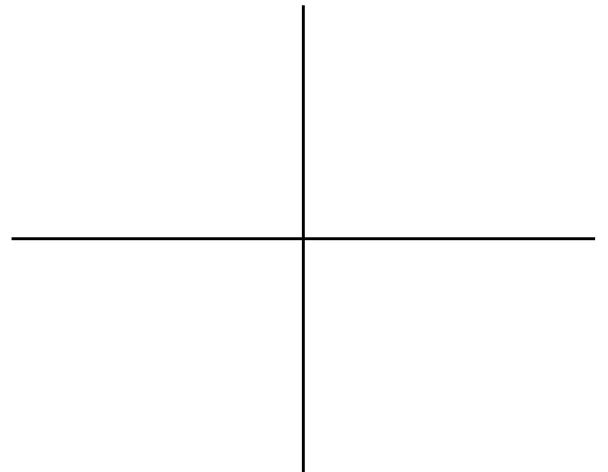
Show all your work for full credit. YOU MAY NOT USE A CALCULATOR UNLESS IT STATES IN THE PROBLEM YOU CAN. Use additional paper if necessary.

1. Using the graph of $f(x)$ given below, find the function $f(x)$.



[/3]

2. Make a sketch of the function **without** the aid of a calculator: $f(x) = -(x + 2)^2 (x - 4) (x^2 - 4)$. Give the coordinates of the x -intercepts and the y -intercept.



[/2]

3. Given the function $f(x) = -4x^3 + 6x^2 - 2x - 3$, use the **remainder theorem** and synthetic division to evaluate:

(a) $f(2)$

(b) $f(-3)$

(c) $f\left(\frac{-1}{2}\right)$

[/3]

4. For the polynomial function $f(x) = 3x^5 - 10x^4 + 13x^3 + 104x^2 + 114x + 36$

(a) Make a list of possible rational zeros. You don't have to put these in numerical order.

[/1]

(b) List ALL possible combinations of *positive*, *negative*, and *complex* zeros of $f(x)$.

[/1]

(c) Use synthetic division and the theorems in this chapter to find ALL the zeros of $f(x)$. Attach an extra sheet of paper showing all of the synthetic division attempts.

[/3]

(d) Write the factored form of $f(x)$ using linear and irreducible quadratic factors, i.e., use no complex numbers.

[/2]
