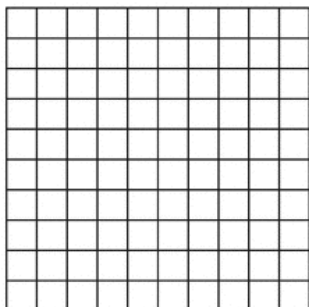


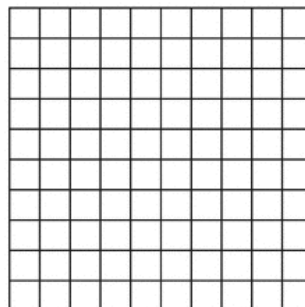
Aim: How do we write equations for cost, revenue, and profit?**I. Do Now:**

1. For each function:
 - (a) find all zeros
 - (b) make a sign chart (# line) showing where $f(x) < 0$ and where $f(x) > 0$.
 - (c) use the sign chart to make a rough sketch of the function

(i) $f(x) = x^3 - 4x$



(ii) $f(x) = (x - 3)(x + 4)(x - 1)(x - 6)$



2. Find the solution set: $x^3 \leq 25x$

3. Find the domain of each function.

(a) $f(x) = \frac{5}{\sqrt{x^2 - 4}}$

(b) $g(x) = \frac{3x}{\sqrt{x^3 - 4x^2 + 4x}}$

II. Motivation:

4. Translate the following statement in English into algebraic symbols.

Pedro build a hamburger stand which he runs by himself. It cost him \$50,000 to build and equip the stand. Each burger costs \$2 to make and he sells them for \$3 each. (Assume that hamburgers are the only item he sells.)

- (a) Write the total cost C as a function of the number of hamburgers sold.
- (b) Write the revenue R as a function of the number of hamburgers sold.
- (c) Write the profit P as a function of the number of hamburgers sold.

III. Application:

5. Stan rents a room in a hotel to host a party. The room rental fee is \$500 and the hotel charges \$10 for each guest who attends. Stan decides to charge each guest a \$20 entry fee at the door.

Let x = the number of people attending the party

- (a) Write the total cost C as a function of the number of people who attend.
- (b) Write the revenue R as a function of the number of people who attend.
- (c) Write the profit P as a function of the number of people who attend.

III. Implied Domain:

6. What is the domain of the functions $C(x)$, $R(x)$, and $P(x)$ as defined above?
7. The function $H(A) = 220 - A$ gives the maximum heart rate for an individual of age A . What is the domain of this function?

MPS21 Homework 12

1. Given $Q(t) = \frac{2t^2 + 3}{t^2}$, evaluate: (a) $Q(2)$ (b) $Q(0)$ and (c) $Q(-x)$

2. Given $f(x) = \frac{|x|}{x}$, evaluate: (a) $f(3)$ (b) $f(-3)$ and (c) $f(t)$

3. Find the domain: (a) $f(x) = \sqrt{9 - x^2}$ (b) $f(x) = \sqrt{x^3 - x}$

4. A company manufactures “pet rocks,” which they sell for \$17.98 each. Their fixed costs are \$98,000 per year and each rock costs \$12.30 to make. Find their cost, revenue, and profit functions in terms of x .
