Closing Thurs: Sup. 1-3, Sup. 4
Closing Tues: Sup. 5
Closing Next Thurs: Sup. 6-7
Today: finish Sup. 5, start Sup. 6

**Entry Task (from Sup. 5 HW)**

Value vs time of a stock is given

![Graph showing stock value over time](image)

\[ t = \text{time (in months)} \]
\[ TG = \text{stock value (in dollars)} \]
\[ TG(t) = \text{“value after t months”} \]

**Directly from Sup. 5 HW:**

2(a): Compute \( TG(3) - TG(1) \)

2(b): Compute the overall rate of change in value at \( t = 6 \).

*Include units.*

2(c): Compute the value of

\[
\frac{TG(1.1) - TG(1)}{0.1}
\]
Sup. 5 / Problem 4:
The graph of $y = f(x)$ is given.

(a) Compute $\frac{f(8)}{8}$

(b) Compute $\frac{f(19) - f(10)}{9}$

(c) Find $x$ such that $\frac{f(x) - f(0)}{x} = 0.3$

(d) Find $x$ such that $f(x) - f(15) = 2$

(h) As $x$ takes on every value from $x = 2$ to $x = 8$, which best describes the values of $\frac{f(x+0.1) - f(x)}{0.1}$?
   i) They increase.
   ii) They increase, then decrease.
   iii) They decrease.
   iv) They decrease, then increase.
Supplement 6: Revenue, Cost, Profit

Story: You own a cupcake business. You charge $1.50 per cupcake. Each day, your rent/utilities are $120 and your salaries for employees are $180. It costs you $0.50 to produce each cupcake.

We will answer the questions:

a) How many cupcakes should you produce and sell to “break even”? 

b) How many should you produce and sell to make a profit of $100?

Key Concepts we will introduce:

1. Total Revenue (TR)
2. Total Costs (TC)
3. Fixed Costs (FC)
4. Variable Costs (VC)

Note:
We will use $q$, or $x$, for the number of items produce or sold (quantity).

1. **Total Revenue (TR)**
   total amount of money you receive from selling $q$ items
2. **Total Cost (TC)**
   total amount of money you pay to produce $q$ items.
Summary:

\[ TR(q) = (\text{Price/item}) \times (\text{items sold}) \]

\[ FC = \text{Fixed Costs} \]

\[ VC(q) = (\text{Cost/item}) \times (\text{items made}) \]

\[ = \text{production cost for } q \text{ items} \]

\[ TC(q) = FC + VC(q) \]

\[ P(q) = \text{Profit to make/sell } q \text{ items} \]

\[ = TR(q) - TC(q) \]

\[ = \text{Vert. gap between TR & TC} \]