1 | **Rate of Change (1, chemical reaction)**

1. Average rate of change (slope) between $t = 20$ and $t = 30$ is 0.615

2. $f(x) = \frac{(A_0(1-\exp(-k(x+p)))) - A_0(1-\exp(-k(x))))}{p}$

   (a) Show that it looks like the tangent at $x = 25$: $y = f(25)(x - 25) + 51.444$

3. Desmos Graph

2 | **Rate of Change (2, washing machines)**

1. Average cost for 100 machines = $\frac{11000}{100} = 110$

2. Derivative is $y = -0.2x + 100$, so we get 80

3. By hard coding the numbers, we get $\left(2000 + 100 \cdot 101 - 0.1(101)^2\right) - \left(\left(2000 + 100 \cdot 100 - 0.1(100)^2\right)\right) = 79.9$ which is roughly 80

4. Demos Graph

3 | **Terminology**

(slide 13 is confusing, see questions.*)*

4 | **Limits**

1. Eq $\frac{x^3-1}{x-1} \Rightarrow \{x^2 + x + 1 : x \neq 1\}$

4.1 | **Limits Practice**

1. $\lim_{x \to 10} 2x + 5 = 25$

2. $\lim_{x \to -2} \frac{x^2-x-6}{x-2} = -5$

3. $\lim_{x \to 4} \frac{x-4}{\sqrt{x}-2} \Rightarrow * \frac{\sqrt{x}+2}{\sqrt{x}+2} \Rightarrow \sqrt{x} + 2 = 4$

4. $\lim_{x \to 0} \frac{sinx}{x}$: $sinx = x$ for small x (SHM), so we can treat it like $\frac{x}{x}$ #todo

5. $\lim_{x \to 0} sin\frac{1}{x}$ Keeps changing… Not sure how to evaluate. #todo

6. $\lim_{x \to 2} \lfloor x \rfloor$