**Math 240 — Hw 1**

*Sara Jamshidi, Jan 17, 2025*

1. Given the function $f(x) = x^2 + 2x + 1$, estimate $f'(2)$ using the points $(1, 4)$ and $(2, 9)$. The actual answer is 6–how close is your estimate?

2. For the function $f(x) = \sin(x)$, estimate $f'\left(\frac{\pi}{7}\right)$ using the points $\left(\frac{\pi}{6}, \sin(\frac{\pi}{6})\right)$ and $\left(\frac{\pi}{4}, \sin(\frac{\pi}{4})\right)$. How good is your estimate?

3. For the function $f(x) = \sqrt{x}$, estimate $f'(0.5)$ using the points $(0, 0)$ and $(1, 1)$. How good is your estimate?

4. Using the table below for $f(x)$, estimate $f'(1.5)$.

| $x$ | $f(x)$ |
|---|---|
| 1 | 2 |
| 1.5 | 2.25 |
| 2 | 2.5 |