score	possible	problem
	20	1
	20	2
	30	3
	30	4
	100	

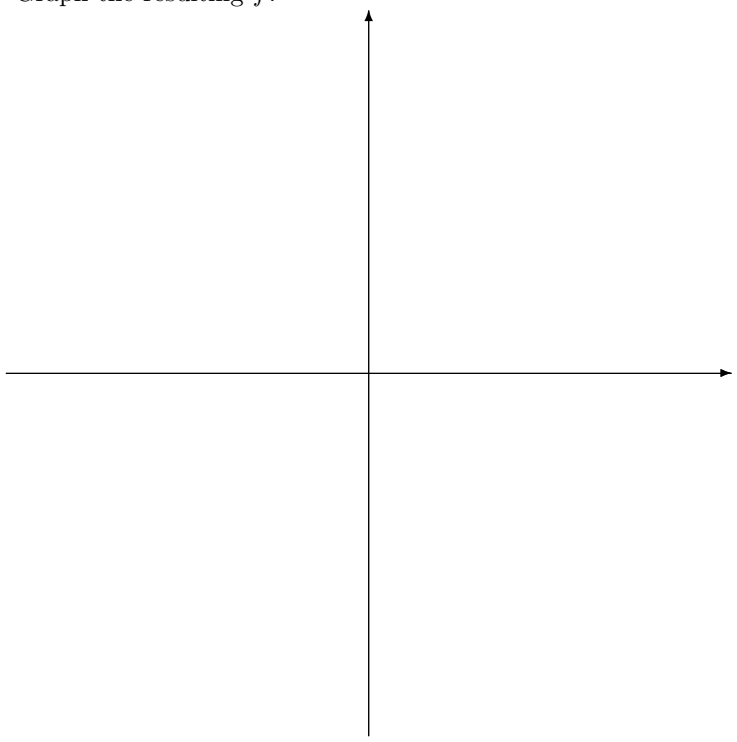
Name: _____
Name: _____
Name: _____
Name: _____

Work in groups of 3 or 4. Show your work. Aknowledge any help on these specific problems.

1. Let $f(x) = \begin{cases} mx + b & \text{if } x < 1 \\ \frac{2}{x} & \text{if } x > 1 \end{cases}$.

/10 (a) Find the values of m and b that make f differentiable.

/10 (b) Graph the resulting f.



2. Compute the following derivatives:

/2 (a) $f(x) = 2 \Rightarrow f'(x) =$

/2 (b) $f(x) = 2x \Rightarrow f'(x) =$

/2 (c) $f(x) = 2x^3 \Rightarrow f'(x) =$

/2 (d) $\dfrac{d}{dx}\left[x^{3/4}\right] =$

/2 (e) $\dfrac{d}{dx}\left[x^{-3/4}\right] =$

/2 (f) $\dfrac{d}{dx}\left[x + \dfrac{1}{x}\right] =$

/2 (g) $D_x\left[3\sin(x)\right] =$

/2 (h) $D_x\left[x\sin(3)\right] =$

/2 (i) $D_x\left[\pi\cot(x)\right] =$

/2 (j) $\left(\sqrt{x}\right)' =$

3. Compute the following derivatives:

/15 (a) $y = \sin(x)(x^8 + x^5 + 3) \Rightarrow \dfrac{dy}{dx} =$

/15 (b) $y = \sin(x)(x^8 + x^5 + 3)(\cos(x) + \sqrt{x}) \Rightarrow \dfrac{dy}{dx} =$

4. Compute the following derivatives:

/15 (a) $y = \dfrac{\sin(x)}{x^8 + x^5 + 3} \Rightarrow \dfrac{dy}{dx} =$

/15 (b) $y = \dfrac{\frac{\sin(x)}{x^8+x^5+3}}{\cos(x) + \sqrt{x}} \Rightarrow \dfrac{dy}{dx} =$