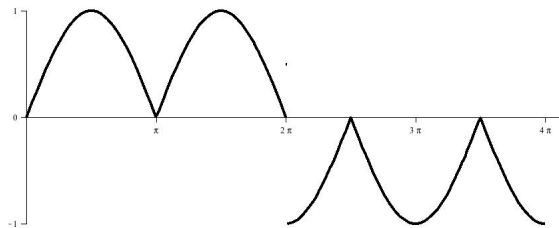
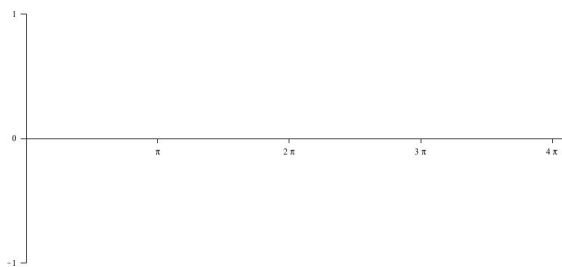


1. (a) (4 points) Below is a graph of $f(x) = \begin{cases} |\sin x|, & 0 < x \leq 2\pi \\ -|\cos x|, & 2\pi \leq x < 4\pi \end{cases}$.



Draw the graph of f' .



- (b) (2 points) For $0 < x < 4\pi$ state at which x the function $f(x)$ is **not** differentiable.

$$x = \pi, 2\pi, \frac{5}{2}\pi, \frac{7}{2}\pi$$

2. (2 points) What value of c would make $g(x)$ continuous when $g(x) = \begin{cases} |\sin x| + 3c, & 0 \leq x \leq 2\pi \\ -|\cos x| - 2c, & 2\pi < x \leq 4\pi \end{cases}$.

$$c = -\frac{1}{5}$$

3. (3 points) The expression

$$\lim_{h \rightarrow 0} \frac{(2+h)^2 e^{2(2+h)} - 4e^4}{h}$$

represents the derivative of a function $g(x)$ at a point $x = a$. What are g and a ?

$$g(x) = e^{2x}$$

$$a = 2$$

4. (1 point) Let $h(x)$ be unknown. Using $h'(a)$, write the equation of the tangent line at $x = a$.

$$y - h(a) = h'(a)(x - a)$$