

Math 1300
Fall 2025
Quiz 5

Name: _____

1. (1 point) Let $f(x) = x^3 e^x$. Find **all** values of x for which $f(x)$ has a horizontal tangent.

- (a) $x = -3, 0$
- (b) $x = -3$
- (c) $x = 0$
- (d) $x = -3, 0, 3$
- (e) none

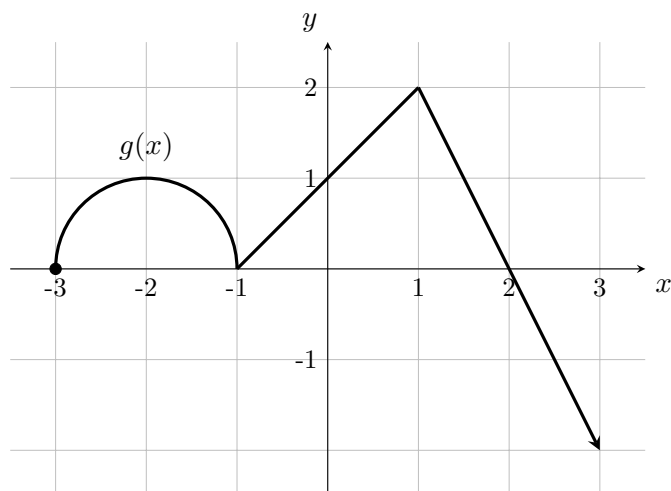
2. (1 point) Compute $\frac{d}{dx} \left(\frac{x^2 + 1}{e^x} \right)$.

- (a) $\frac{2x}{e^x}$
- (b) $\frac{2x + x^2 + 1}{e^x}$
- (c) $\frac{2x - x^2 - 1}{e^x}$
- (d) $-\frac{x^2 + 1}{e^x}$
- (e) $\frac{2x - x^2 - 1}{e^{2x}}$

3. (2 points) Compute $f'(1)$, given that $f(x) = \frac{\sqrt[3]{x} - \sqrt{x}}{x}$.

- (a) $-\frac{7}{6}$
- (b) $-\frac{1}{6}$
- (c) $-\frac{1}{3}$
- (d) $\frac{1}{6}$
- (e) 0

4. (6 points) Use the following graph and table to answer the questions below.



x	$f(x)$	$f'(x)$
-2	1	-2
-1	-1	1
0	4	-3
1	1	2
2	-1	3

(a) If $P(x) = \frac{f(x)}{g(x)}$, find $P'(0)$.

- (a) -7
- (b) -3
- (c) 1
- (d) 4
- (e) 7

(b) If $Q(x) = xf(x)$, find $Q'(-2)$.

- (a) -3
- (b) -1
- (c) 2
- (d) 4
- (e) 5

(c) If $R(x) = \frac{f(x)g(x)}{x}$, find $R'(2)$.

- (a) -1
- (b) 0
- (c) $\frac{1}{2}$
- (d) 1
- (e) 2