

Math 2300
Spring 2026
Quiz 6

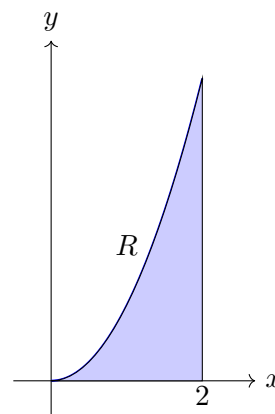
Name: _____

1. (2 points) Consider the region R shown on the right, which is bounded by the curve $y = x^2$, the x -axis, and the line $x = 2$. The area of the region is

$$A = \int_0^2 x^2 dx = \frac{8}{3}.$$

Which of the following is the correct value of \bar{x} , the x -coordinate of the center of mass?

- (a) $\frac{4}{3}$ (b) $\frac{3}{2}$ (c) $\frac{8}{5}$ (d) $\frac{5}{3}$ (e) $\frac{7}{4}$



2. (2 points) Which of the following sets of parametric equations describes a circle of radius 4, centered at $(1, -3)$, that is traced exactly once in a **counterclockwise** direction for $0 \leq t \leq 2\pi$?

- (a) $x = 1 + 4 \cos(-t)$, $y = -3 + 4 \sin(-t)$
(b) $x = 1 + 4 \cos(\pi - t)$, $y = -3 + 4 \sin(\pi - t)$
(c) $x = 1 + 4 \sin t$, $y = -3 + 4 \cos t$
(d) $x = 1 + 4 \cos t$, $y = -3 + 4 \sin t$
(e) $x = 1 + 4 \cos(2t)$, $y = -3 + 4 \sin(2t)$

3. (2 points) Given the parametric equations

$$x(t) = e^t - 2, \quad y(t) = t^2 + t - 3,$$

find the equation of the tangent line to the curve when $t = 0$.

- (a) $y = x - 1$
(b) $y = x + 2$
(c) $y = x - 2$
(d) $y = 2x - 3$
(e) $y = -2x - 3$

4. (4 points) Consider the parametric equations

$$x(t) = t^2, \quad y(t) = 2t^2, \quad t \geq 0.$$

Find the arc length of the curve from $(0, 0)$ to $(4, 8)$.