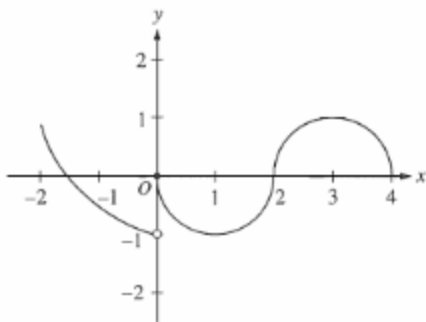


AP Calculus BC Multiple Choice Practice with Derivatives

NO CALCULATOR (20 minutes)

1. If $x^2 + xy = 10$, then when $x = 2$, $\frac{dy}{dx} =$

2. What is the instantaneous rate of change at $x = 2$ of the function f given by $(x) = \frac{x^2-2}{x-1}$?



3. The graph of the function f shown in the figure above has a vertical tangent at the point $(2, 0)$ and horizontal tangents at the points $(1, -1)$ and $(3, 1)$. For what values of x , $-2 < x < 4$, is f not differentiable?

4. A particle moves along the x -axis so that its position at time t is given by $x(t) = t^2 - 6t + 5$. For what value of t is the velocity of the particle zero?

5. If $f(x) = \sin(e^{-x})$, then $f'(x) =$

6. If $f(x) = \tan(2x)$, then $f'\left(\frac{\pi}{6}\right) =$

7. Given that $5x^3 - 4xy - 2y^2 = 1$. Determine the change in y with respect to x .
8. An equation of the line tangent to the graph of $y = x + \cos x$ at the point $(0, 1)$ is:
9. The slope of the tangent line to the graph of $4x^2 + cx - 2e^y = -2$ at $x = 0$ is 4. Give the value of c .

10. Compute $\lim_{t \rightarrow 0} \left(\frac{\tan(\frac{1}{4}\pi + t) - \tan(\frac{1}{4}\pi)}{t} \right)$

USE OF GRAPHING CALCULATOR IS PERMITTED (9 minutes)

11. The radius of a circle is decreasing at a constant rate of 0.1 centimeters per second. In terms of the circumference C , what is the rate of change of the area of the circle, in square centimeters per second?
12. Let f be the function given by $f(x) = 3e^{2x}$ and let g be the function given by $g(x) = 6x^3$. At what value of x do the graphs of f and g have parallel tangent lines?
13. At what approximate rate (in cubic meters per minute) is the volume of a sphere changing at the instant when the surface area is 5 square meters and the radius is increasing at the rate of $1/3$ meters per minute?