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Question 1 **(1 pts)**

Suppose you have a function, $f(x)$, that represents some curve, and a point (a, b) on the curve. How do you find the slope of the tangent line at that point?

A. Plug in the given point, and write in $y = mx + b$ form.

B. Find the derivative of $f(x)$.

C. Re-write the function in point-slope form.

D. Find the derivative of $f(x)$, and then determine the value of the derivative at that point.

Question 2 **(1 pts)**

If c is a constant and f is a differentiable function, then $\frac{d}{dx}[cf(x)]$ is equivalent to:

A. $c\frac{d}{dx}f(x)$

B. $\frac{d}{dx}cf(x)$

C. $\frac{d}{dx}f(x)c$

D. $f(x)$

Question 3 **(1 pts)**

If f and g are both differentiable functions, then $\frac{d}{dx}[f(x)g(x)]$ is equivalent to:

A. $\frac{d}{dx}f(x)\frac{d}{dx}g(x)$

B. $\frac{d}{dx}[f(x) + g(x)]$

C. $f(x)[\frac{d}{dx}g(x)] + g(x)[\frac{d}{dx}f(x)]$

D. $\frac{d}{dx}f(x) + \frac{d}{dx}g(x)$

Question 4 **(1 pts)**

If f and g are both differentiable functions, then $\frac{d}{dx}[\frac{f(x)}{g(x)}]$ is equivalent to:

A. $\frac{\frac{d}{dx}f(x)}{\frac{d}{dx}g(x)}$

B. $\frac{g(x)\frac{d}{dx}[f(x)] - f(x)\frac{d}{dx}[g(x)]}{[g(x)^2]}$

C. $\frac{\frac{d}{dx}f(x) - \frac{d}{dx}g(x)}{f(x)g(x)}$

D. $\frac{d}{dx}f(x) - \frac{d}{dx}g(x)$

Question 5 (1 pts)

Two lines are parallel if:

A. They have the same slope.

B. They are continuous.

C. They have the same y-intercept.

D. They pass the vertical line test.

Question 6 (1 pts)

Match the functions below (A-D) with their derivatives (E-H).

(Write your answers as A-G, B-F, etc.)

A. $\frac{d}{dx}csc(x)$

B. $\frac{d}{dx}sec(x)$

C. $\frac{d}{dx}cot(x)$

D. $\frac{d}{dx}cos(x)$

E. $-csc(x)cot(x)$

F. $-csc^2(x)$

G. $-sin(x)$

H. $sec(x)tan(x)$

Question 7 (1 pts)

$f(x) = cos(x)$. What is $f'(\frac{\pi}{2})$?

A. 1

B. 0

C. -1

D. $-sin(x)$

Question 8 (1 pts)

$f(x) = sin(x)$. What is $f'(\frac{\pi}{4})$?

A. 0

B. $\frac{\sqrt{2}}{2}$

C. 1

D. $-\frac{\sqrt{2}}{2}$

Question 9 **(1 pts)**

Given a function $f(x)$, when would we have a horizontal tangent line?

A. When $f'(x) = 0$.

B. When the function is continuous.

C. When $x = 0$.

D. When $f(x) = 0$.

Question 10 **(1 pts)**

Calculate $\lim_{x \to 0} \frac{sin^2(x)}{x}$

A. 1

B. $sin(x)$

C. -1

D. 0