

Quiz 5A

Closed book/notes. No calculators allowed.

Name:

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Solution

1. The tangent line to the graph of f , at $x = 2$, has the equation $y = \frac{1}{2}x + 2$. Fill in the blanks below.

→ is the slope of the tangent line

(A) (2 Points) $f'(2) = \underline{2}$

(B) (3 Points) $f(2) = \underline{4}$

Recall the equation of a tangent line to f at $x = x_0$ is given by $y - f(x_0) = f'(x_0)(x - x_0)$.

So, $y = f(2) + f'(2)(x - 2) = \frac{1}{2}x + 2$

or $y = f'(2)x - 2f'(2) + f(2)$

So, $\boxed{f'(2) = 2}$ and $2 = -f'(2) + f(2)$

$2 = -2 + f(2)$

$\boxed{f(2) = 4}$

2. (5 Points) Find $f'(x)$.

$$f(x) = (\cos(x) + x^3) \tan(x)$$

Use product rule:

$$f'(x) = (\cos(x) + x^3)' \tan(x) + (\cos(x) + x^3) \cdot (\tan(x))'$$

$$\boxed{f'(x) = (-\sin(x) + 3x^2) \tan(x) + (\cos(x) + x^3) \cdot \sec^2(x)}$$

Grade: /10