

THIS IS A NO CALCULATOR QUIZ

[4 POINTS]

Find the equation of the tangent to the function $f(x) = \int_{-3}^x \cos \pi t^2 dt$ at $x = -3$.

$$f'(x) = \cos \pi x^2$$

$$f'(-3) = \cos 9\pi = -1$$

$$f(-3) = \int_{-3}^{-3} \cos \pi t^2 dt = 0$$

$$y - 0 = -1(x - (-3))$$

$$y = -x - 3$$

[5 POINTS]

Find the average value of the function $f(x) = \frac{3x-2}{\sqrt{x}}$ on the interval $[4, 9]$.

$$\frac{1}{9-4} \int_4^9 \frac{3x-2}{\sqrt{x}} dx$$

$$= \frac{1}{5} \int_4^9 \frac{3x-2}{x^{\frac{1}{2}}} dx$$

$$= \frac{1}{5} \int_4^9 (3x^{\frac{1}{2}} - 2x^{-\frac{1}{2}}) dx$$

$$= \frac{1}{5} \left(3 \cdot \frac{2}{3} x^{\frac{3}{2}} - 2 \cdot 2x^{\frac{1}{2}} \right) \Big|_4^9$$

$$= \frac{1}{5} \left(2x^{\frac{3}{2}} - 4x^{\frac{1}{2}} \right) \Big|_4^9$$

$$= \frac{1}{5} \left(2 \cdot 9^{\frac{3}{2}} - 4 \cdot 9^{\frac{1}{2}} - (2 \cdot 4^{\frac{3}{2}} - 4 \cdot 4^{\frac{1}{2}}) \right)$$

$$= \frac{1}{5} (54 - 12 - (16 - 8))$$

$$= \frac{1}{5} (34) = \frac{34}{5}$$

1 POINT
EACH

SUBTRACT
 $\frac{1}{2}$ POINT
EACH TIME
YOU FORGOT
TO WRITE "dx"

[1 POINT]

Circle the only function and interval below to which the Integral Mean Value Theorem applies. —

$j(x) = \sec x$ on $[0, \pi]$

$g(x) = \ln x$ on $[0, 5]$

$k(x) = \frac{1}{x}$ on $[-2, -1]$

$f(x) = \frac{1}{x^2 - 4}$ on $[-2, 2]$

FUNCTION MUST
BE CONTINUOUS
ON INTERVAL