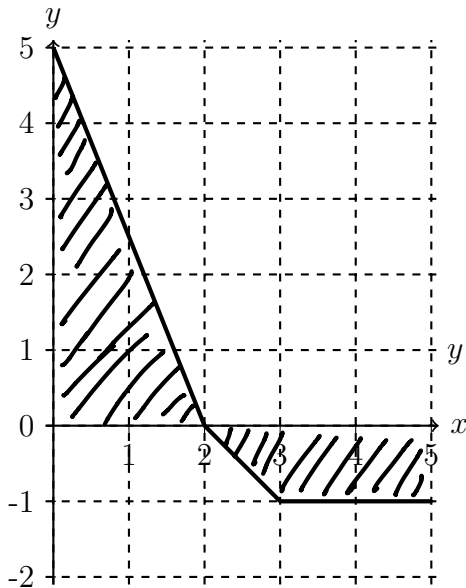


You may not use any supplemental materials on this quiz, except a TI-30 calculator. Remember that in your written work you are graded on the correctness of your supporting work and not just your final answer. Always give an exact answer unless you are explicitly told to round; calculator approximations will not receive full credit.

1. (2 points) Use areas to evaluate the integral  $\int_0^5 f(x) dx$ .



$$= \frac{1}{2}(5)(2) - \left(\frac{1}{2} + 2\right)$$

$$= 5 - \frac{5}{2} = \boxed{\frac{5}{2}}$$

$y = f(x)$  \*  
 move this

2. (3 points) Use the Max/Min Inequality to estimate the value of  $\int_{-1}^1 e^{-x^2} dx$ .

$$f(x) = e^{-x^2}$$

$$f'(x) = e^{-x^2} \cdot -2x$$

CN:  $x = 0$

x	f(x)
-1	$e^{-1} \leftarrow \text{min} = m$
0	$1 \leftarrow \text{max} = M$
1	$e^{-1}$

$$\boxed{e^{-1} \cdot 2 \leq \int_{-1}^1 e^{-x^2} dx \leq 1 \cdot 2}$$

(The quiz continues on the back.)

3. (2 points) Determine  $\int_1^5 \left( \frac{1}{x} - \frac{1}{\sqrt[9]{x^2}} \right) dx$ .

$$= \int_1^5 \left( \frac{1}{x} - x^{-2/9} \right) dx = \left[ \ln|x| - \frac{9}{7} x^{7/9} \right]_1^5$$

$$= \left( \ln(5) - \frac{9}{7} \cdot 5^{7/9} \right) - \left( 0 - \frac{9}{7} \right)$$

4. (3 points) Determine  $\frac{d}{dx} \left( \int_3^{\ln(x)} \cos(t^2) dt \right)$ .

$$= \boxed{\cos(\ln(x)^2) \cdot \frac{1}{x}}$$

$$f(x) = \int_3^{\ln(x)} \cos(t^2) dt$$

$$f(x) = g(h(x))$$

$$g(x) = \int_3^x \cos(t^2) dt$$

$$\begin{aligned} f'(x) &= g'(h(x)) \cdot h'(x) \\ &= \cos(\ln(x)^2) \cdot \frac{1}{x} \end{aligned}$$

$$h(x) = \ln(x)$$