MTH 112 Test 1
Fall 2020

Name _____ **Calculus II**

When finished submit your answers at **https://pryor.mathcs.wilkes.edu/submissions**.
If you feel the answer is none of the choices given, submit no answer to the question.

1. Given $f(x)=\int \frac{e}{x^2}\,dx$ where $f(e)=\pi$, find C.

2. What would be the first step to find $f(x)=\int \frac{2x+5}{x^2+9}\,dx$?

3. Which function below is equivalent to $f(x)=\int_{x=0}^{x=4} \frac{dx}{1+\sqrt{x}}$ using an appropriate substitution of u for x?

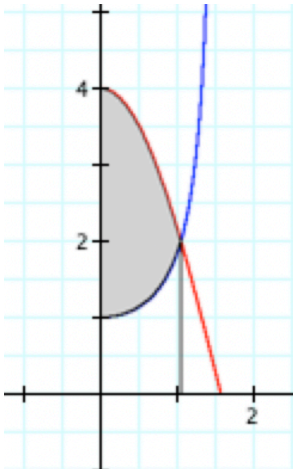
a. $f(u)=\int_{u=0}^{u=2} u^2+1\,du$

b. $f(u)=\frac{1}{2}\int_{u=0}^{u=4} 1+\frac{1}{1+u}\,du$

c. $f(u)=2\int_{u=0}^{u=2} \frac{u}{u+1}\,du$

d. $f(u)=\int_{u=0}^{u=2} \frac{u+1}{u}\,du$

4. What is the area between $f(x)=4\cos x$ and $g(x)=\sec x$?



a. $\frac{\sqrt{3}}{2}-\ln\left|\frac{\sqrt{3}}{2}-\sqrt{3}\right|$

b. $\ln\left|\frac{\sqrt{3}}{2}\right|-\frac{\sqrt{3}}{2}$

c. $\frac{\sqrt{3}}{2}$

d. 1

5. Given $f(x)=\int \sin^2 6x\cos 6x\,dx$, what is $f\left(\frac{\pi}{3}\right)$ if $f(0)=\pi$?

a. π **b.** 0 **c.** 2π **d.** $-\pi$

6. How would you rewrite and simplify $\sqrt{e^{x+3}}$ in order to evaluate $f(x)=\int \sqrt{e^{x+3}}\,dx$?

7. The electric current in a certain inductor is given by $i(t)=8\int \frac{dt}{100+t^2}$, what would be the current at $t = 10$ if $i(0)=10$?

a. $\frac{\pi}{40}$ **b.** $\frac{\pi}{4}$ **c.** $\frac{\pi}{400}$ **d.** $\frac{2\pi}{5}$

8. Given the differential equation $\frac{dy}{dx}=\frac{x}{1+x^2}$, what is $y(1)$ if $y(0)=\ln 2$?

a. $\frac{3}{2}\ln 2$ **b.** $\ln 8$ **c.** $\frac{1}{2}\ln 2$ **d.** $\frac{3}{2}$

9. Find $\int_{x=\frac{\pi}{6}}^{x=\frac{3\pi}{4}} \frac{\sin 2x}{1-\cos^2 x}dx$ (Note: $\sin 2x = 2\sin x\cos x$)

a. $\ln 2$ **b.** $2\sqrt{2}$ **c.** -1 **d.** $\frac{\sqrt{3}}{4}$

10. What is the area under $f(x)=\frac{\sin 2x}{1-\cos^2 x}$ from $x=\frac{\pi}{6}$ to $x=\frac{3\pi}{4}$?

a. $\ln 2$ **c.** $3\ln 2$

b. $\frac{\sqrt{3}}{2}$ **d.** 2