Chapter 8 Exam Review Problems

1. $\int \frac{dx}{(x-1)(x+2)} =$

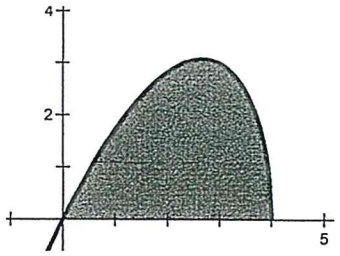
a) $\frac{1}{3}\ln\left|\frac{x-1}{x+2}\right|+C$ b) $\frac{1}{3}\ln\left|\frac{x+2}{x-1}\right|+C$ c) $\frac{1}{3}\ln\left|(x-1)(x+2)\right|+C$

d) $\left(\ln|x-1|\right)\left(\ln|x+2|\right)+C$ e) $\ln\left|(x-1)(x+2)^2\right|+C$

2. $\int_{-1}^{1} \frac{3}{x^2}\,dx$ is

a) -6 b) -3 c) 0 d) 6 e) nonexistent

3. Find the area of the region above the x-axis and below the function $y = x\sqrt{4-x}$.



4. Consider the graph of $y = xe^{-x/3}$.
Find the area under this graph of the curve between $x = 0$ and $x = 2$.

5. Consider the function $h(x) = \frac{x - \cos x}{x}$.

a) Find $\lim_{x\to\infty} h(x)$.

b) Set up the integral needed to find the area under the graph of $h(x)$ between $x = 1$ and $x = \pi$ (above the x-axis). Do not solve.

Ideas for you to be familiar with, but will not be on the test tomorrow.

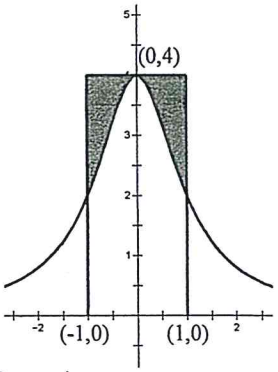
6. Which of the following is equal to $\int \frac{1}{\sqrt{25-x^2}}\,dx$

a) $\arcsin\frac{x}{5}+C$ b) $\arcsin x+C$ c) $\frac{1}{5}\arcsin\frac{x}{5}+C$

d) $\sqrt{25-x^2}+C$ e) $2\sqrt{25-x^2}+C$

7. The equation of the curve shown on the right is $y=\frac{4}{1+x^2}$.

What does the area of the shaded region equal?



a) $4-\frac{\pi}{4}$ b) $8-2\pi$ c) $8-\pi$ d) $8-\frac{\pi}{2}$ e) $2\pi-4$

1. A
2. E
3. $\frac{128}{15}$
4. $-15e^{-2/3}+9$
5. a) 1

   b) $\int_1^{\pi} \frac{x-\cos x}{x}\,dx$
6. A
7. B