번호	1	2	3	4	5	6	7	합계
점수								

과 목 명	담당교수명	학부(과),전공	학 년	학번	성명	검인
수학1						(인)

☞ **주의 사항**

⊙ 일체의 부정행위를 금지한다.

⊙ 모든 풀이 과정을 제외한 모든 답은 답란에 적으시오

⊙ 개인 연습장과 계산기 사용을 금지 한다.

⊙ 입실후 30분이내 퇴실금지.

⊙ 반드시 풀이과정을 적으시오.

1. (each 5pts)Calculate the followings.

(1) $\int_0^{\sqrt{x}} x\cos(x^2)dx$

Ans _____

(2) $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \frac{x^2\sin x}{1+x^6}\,dx$

Ans _____

2. (each 5pts)Evaluate the following.

(1) $\sin^{-1}x + \cos^{-1}x$

Ans _____

(2) $\sinh^2(x) - \cosh^2(x)$

Ans _____

3. (10pts) Evaluate
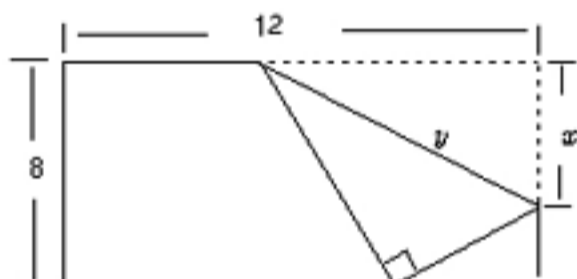
$\lim_{x \to 1}(\frac{1}{\ln x} - \frac{1}{x-1})$.

Ans _____

4. (10pts)Explain that the function

$f(x) = x^{101} + x^{51} + x + 1$

has neither a local maximum nor a local minimum.

5. (10pts)The upper right-had corner of a piece of paper 12 by 8 shown as in the figure. is folded over to the bottom edge. How would you fold it so as to minimize the length of the fold? In other words. how would you choose x to minimize y?

Ans:_____

6. (10pts)Find the volume generated by rotating the region bounded by the given curves about the specified axis.(Use the method of cylindrical shells).

$y = x, y = 0, x = 2, x = 4$:about $x = 1$

Ans_____

7. For $f(x) = \dfrac{x^2}{\sqrt{x+1}}$. answer the following questions.(eahc 4pts)

(a) Find the vertical and horizontal asymptotes.

Ans _____

(b) Find the intervals of increase or decrease.

Ans _____

(c) Find the local maximum and minimum values.

Ans _____

(d) Find the interval of concavity and the infection points.

Ans _____

(e) Use the information from parts(a) $-$(d) to sketch the graph of f.

Ans _____