

## 1.

1.	$\int_{-\frac{\pi}{2}}^{0} \sqrt{\cos x - \cos x}$	$\cos^3 x  dx$		



(1) 
$$\frac{2}{3}$$

(2) 
$$-\frac{2}{3}$$
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2. The value of the integral 
$$\int_{0}^{1} \sqrt{\frac{1-x}{1+x}} dx$$
 is

(1) 
$$\frac{\pi}{2} - 1$$

(4) 
$$\frac{\pi}{2} + 1$$

Evaluate the following 
$$\int_{0}^{\frac{1}{2}} \frac{x \sin^{-1} x}{\sqrt{1 - x^{2}}} dx$$

$$(2)$$
  $6\pi - \sqrt{2}$ 

(3) 1

(1) 
$$\frac{\sqrt{3}\pi}{12}$$
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$$(3) \quad \frac{6\pi - \sqrt{3}}{12}$$

4. Let 
$$F(x) = f(x) + f\left(\frac{1}{x}\right)$$
, where  $f(x) = \int_{1}^{x} \frac{\log t}{1+t} dt$ , Then  $F(e)$  equals

(4) 
$$\frac{6-\pi\sqrt{3}}{12}$$
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$$(2)$$
  $(4)$ 

5. The value of 
$$x>1$$
 satisfying the equation  $\int\limits_{-\infty}^{x}t\log tdt=\frac{1}{4},$  is

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$$\binom{1}{2} \frac{m_3}{e^2}$$
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(1) 
$$\sqrt{e}$$
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(4) 
$$2e - 1$$

If for 
$$n \geqslant 1$$
,  $P_n = \int_1^e (\log x)^n dx$ , then  $P_{10} - 90P_8$  is equal to though

(1) 
$$10e$$

$$(4)$$
  $-9e$  mathongo

7. If 
$$\int_0^\infty e^{-ax} dx = \frac{1}{a}$$
, then  $\int_0^\infty x^n e^{-ax} dx$  is

(1)  $\frac{(-1)^n n!}{n!}$ 

(2) 
$$\frac{(-1)^n(n-1)}{a^n}$$

(1) 
$$\frac{(-1)^m}{a^{m+1}}$$
 (3)  $\frac{n!}{a^{m+1}}$  (3)  $\frac{n!}{a^{m+1}}$  (3)  $\frac{n!}{a^{m+1}}$  (4) mathongo (7) mathongo (8) If  $m,n\in N$ , then  $I_{m,n}=\int_0^1 x^m(1-x^n)dx$  is equal to

(1) 
$$\frac{m \ln!}{(m+n+2)!}$$
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(2) 
$$\frac{2m!n!}{(m+n+1)!}$$
 (4) None of these

$$\frac{\pi}{(m+n+1)!}$$

$$\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \frac{\cot x}{\cot x + \cot x} dx = m(\pi+n), \text{ then } mn \text{ is equal to}$$

If 
$$\int_{0}^{\frac{\pi}{2}} \frac{dx \cos x}{\cot x + \csc x} dx = m(\pi + n)$$
, then  $mn$  is equal to  $m$  mathongo  $m$ 

$$\prod_{0} \int_{0}^{\infty} \frac{1}{\cot x + \csc x} dx = m(n+n), \text{ then } mn \text{ is equal to}$$
(1) 1

(2) 
$$\frac{1}{2}$$

$$(4)_{1\overline{11}}\frac{1}{2}$$
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(3) 
$$-1$$
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