King Fahd University of Petroleum and Minerals
Department of Mathematics & Statistics
Math 102(35) Class Test I spring 2013(132)

ID#:_____ NAME:_____

Encircle the Right Answer with a Detail Solution- No Scores without a Complete Explanation

1. $\int_0^{\pi/2} \frac{dx}{1+\tan^2 x} =$

   (a) 2π
   (b) 0
   (c) $\pi/4$
   (d) $\pi/2$
   (e) π

2. $\int_0^2 4 \mid 2x-1 \mid \, dx =$

   (a) 10
   (b) 8
   (c) 12
   (d) 14
   (e) 16

3. $\int_{\frac{\pi}{4}}^{\frac{\pi}{2}} \frac{dx}{\sqrt{1-\cos^2 x}} =$

   (a) $\ln(1-\sqrt{2})$
   (b) $\ln(1+\sqrt{2})$
   (c) $\ln(\sqrt{2}-1)$
   (d) 0
   (e) $\ln(\sqrt{2})$

4. The area bounded by the x-axis, the curve $y = \dfrac{1}{\sqrt{3x+1}}$, and the lines $x = 0$, $x = 5$, is:

   (a) 1

   (b) 6

   (c) 2π

   (d) 2

   (e) 3

5. If the area bounded by the graph of $y = f(x)$, $a \leq x \leq b$, and the x-axis is equal to $b^2(b-a)$, then $f(x)$ is equal to:

   (a) $x^2 - xa$

   (b) $3x^2 - 2xa$

   (c) $2x^3 - x^2a$

   (d) $2x^3 - xa$

   (e) $x^3 - xa$

6. The slope of the tangent to the curve $y = \displaystyle\int_0^{\sqrt{x}} e^{-t^2}\,dt$, $(x > 0)$ at $x = 4$ is given by:

   (a) e^{-4}

   (b) e^{-16}

   (c) $-8e^{-16}$

   (d) $\dfrac{1}{4}e^{-4}$

   (e) $e^{-4} - 1$

7. $\displaystyle\int_{-1}^{0} \frac{dx}{x^2+2x+2} =$

(a) $\dfrac{\pi}{2}$

(b) $-\dfrac{\pi}{4}$

(c) $\dfrac{\pi}{4}$

(d) $-\dfrac{\pi}{2}$

(e) $\dfrac{5\pi}{4}$

8. $\displaystyle\int \frac{dx}{\sqrt{x}(1+\sqrt{x})} =$

(a) $\ln(1+\sqrt{x})+C$

(b) $\ln\sqrt{1+x}+C$

(c) $\dfrac{(1+\sqrt{x})^{3/2}}{3/2}+C$

(d) $\ln(1+x+2\sqrt{x})+C$

(e) $\dfrac{(1+\sqrt{x})^{1/2}}{1/2}+C$

9. The area bounded by the graphs of $x=y^2-y$ and $x=y-y^2$ is equal to:

(a) 2

(b) $\dfrac{2}{3}$

(c) $\dfrac{1}{3}$

(d) 1

(e) 4

10. $\displaystyle\int \frac{\sec^2 x\, dx}{\tan x\sqrt{\tan^4 x - 1}} =$

(a) $\dfrac{1}{2}\tan x + C$

(b) $\dfrac{1}{2}\tan^{-1}(\sec^2 x) + C$

(c) $2\sec^{-1}(\tan^2 x) + C$

(d) $\dfrac{1}{2}\sec^{-1}(\tan x^2) + C$

(e) $\dfrac{1}{2}\sec^{-1}(\tan^2 x) + C$

11. $\displaystyle\int \sqrt{1+\tan x}(1+\tan^2 x)\, dx$ is equal to:

(a) $\dfrac{1}{2}(1+\tan x)^{-\frac{1}{2}} + C$

(b) $\dfrac{2}{3}(1+\tan x)^{3/2} + C$

(c) $\dfrac{1}{2}\sec^2 x + C$

(d) $2(x+\tan x)^{1/2} + C$

(e) $\dfrac{3}{2}(1+\tan x)^{3/2} + C$

12. The area bounded by the curve $y = \tan x$, the x-axis, $x = -\dfrac{\pi}{3}$, and $x = \dfrac{\pi}{3}$ is equal to:

(a) $\dfrac{2}{\sqrt{3}}$

(b) $\ln\dfrac{3}{4}$

(c) $\ln\dfrac{2}{\sqrt{3}}$

(d) $\ln 4$

(e) $\ln\dfrac{4}{3}$

13. $\dfrac{d}{dx}\displaystyle\int_{\sqrt{3}}^{2} \frac{\sqrt{x^2-3}}{x}\,dx$ is equal to:

(a) $\dfrac{1}{\sqrt{3}} - \dfrac{\pi}{6}$

(b) $\tan 2 + \sqrt{3} - (\tan\sqrt{3} + 2)$

(c) 0

(d) $\dfrac{1}{\sqrt{3}} - \dfrac{\pi}{3}$

(e) $\dfrac{1}{\sqrt{3}} + \dfrac{\pi}{3}$

14. $\displaystyle\int \frac{x+1}{\sqrt{4-x^2}}\,dx$ is equal to:

(a) $\sqrt{4-x^2} - \sin^{-1}\dfrac{x}{2} + C$

(b) $-\sqrt{4-x^2} + \sin^{-1} x + C$

(c) $-\dfrac{2}{\sqrt{4-x^2}} + \sin^{-1}\dfrac{x}{2} + C$

(d) $-\sqrt{4-x^2} + \sin^{-1}\dfrac{x}{2} + C$

(e) $-\sqrt{4-x^2} + \sin^{-1} 2x + C$

15. $\displaystyle\int_{e}^{e^2} \frac{dx}{x\ln x}$ is equal to:

(a) 2

(b) $e^4 - e^2$

(c) $\ln 2$

(d) $2\ln 2$

(e) $\dfrac{e^2-1}{2e^4}$