1. $\int_0^3 \sqrt{9-x^2}\,dx =$

Similar to Example #3 part c Page 310

Also, similar to Q.# 35-36 page 314

(a) $\frac{9}{4}\pi$ (correct)

(b) $\frac{9}{2}\pi$

(c) 9π

(d) $\frac{9}{8}\pi$

(e) 18π

2. If a and b are the real numbers that maximize $\int_a^b (4-x^2)\,dx$, then $a+2b =$
(Hint: Graph the function $f(x) = 4-x^2$).

Similar to Q # 81 page 316.

(a) 2 (correct)

(b) 4

(c) -4

(d) 0

(e) -2

3. The average value of the function

$$f(x) = \frac{4(x^2+1)}{x^2}$$

over the interval $[1, 4]$ is

Q#52 page #329

(a) 5 (correct)

(b) 6

(c) 10

(d) 12

(e) 14

4. Let f be a continuous function and c be a positive real number such that

$$\int_c^x f(t)\,dt = x^2 + 2x - 3$$

Then $f(c) =$

Q#112 page 331.

(a) 4 (correct)

(b) 3

(c) 2

(d) 5

(e) 6

5. $\int_9^{16} \frac{10}{\sqrt{x}(1+\sqrt{x})^2}\,dx =$

Similar to Q 79 page 342

(a) 1 _____ (correct)

(b) 2

(c) 3

(d) 4

(e) 0

6. $\int 15x\sqrt{1-x}\,dx =$

Similar to Q 65-68

(a) $6(1-x)^{\frac{5}{2}} - 10(1-x)^{\frac{3}{2}} + C$ _____ (correct)

(b) $6(1-x)^{\frac{5}{2}} - 4(1-x)^{\frac{3}{2}} + C$

Page # 342

(c) $4(1-x)^{\frac{5}{2}} - 10(1-x)^{\frac{3}{2}} + C$

(d) $4(1-x)^{\frac{5}{2}} - 6(1-x)^{\frac{3}{2}} + C$

(e) $10(1-x)^{\frac{5}{2}} - 6(1-x)^{\frac{3}{2}} + C$

7. $\int_3^4 \frac{3x}{(x-2)^2}\,dx =$

Similar to Q # 27 page 362

(a) $3 + 3\ln 2$ (correct)

(b) $2 + 3\ln 2$

(c) $2 + 2\ln 2$

(d) $3 + \ln 2$

(e) $3 + 2\ln 2$

8. $\int_0^{\pi} \left(1 - \tan\frac{\theta}{4}\right) d\theta =$

Similar to Q # 36 page 362

(a) $\pi - 2\ln 2$ (correct)

(b) $\pi - 4\ln 2$

(c) $\pi - \ln 2$

(d) $\pi + 2\ln 2$

(e) $\pi + 3\ln 2$

9. $\int_0^{\frac{1}{\sqrt{2}}} \frac{\cos^{-1}(x)}{\sqrt{1-x^2}}\,dx =$

$(\cos^{-1}(x) = \arccos x)$

Q #34 page #370

(a) $\frac{3\pi^2}{32}$ _____(correct)

(b) $-\frac{3\pi^2}{32}$

(c) $\frac{3\pi^2}{16}$

(d) $-\frac{3\pi^2}{16}$

(e) $\frac{\pi^2}{32}$

10. $\int_3^{\sqrt{3}} \frac{dx}{x\sqrt{4x^2-9}} =$

Q # 26 page # 370

(a) $-\frac{\pi}{18}$ _____(correct)

(b) $\frac{\pi}{9}$

(c) $\frac{\pi}{6}$

(d) $\frac{\pi}{18}$

(e) $-\frac{\pi}{9}$

11. $\int_{-1}^{1} \operatorname{sech}^3 x \tanh x \, dx =$

(a) 0 (correct)

(b) $\frac{2e^3 - 16}{3e^3}$

(c) $\frac{2e^3 + 16}{3e^3}$

(d) $\frac{3e^3 + 16}{2e^3}$

(e) $\frac{3e^3 - 16}{2e^3}$

Similar to Q# 54 page # 381

By the way the function $\operatorname{sech}^3 x \tanh x$ is an odd function and we know that if $f(x)$ is an odd function, then $\int_{-a}^{a} f(x)\,dx = 0$ without solving the integral!!!

12. The area of the region bounded by the graphs of $x = 4 - y^2$ and $x = y + 2$ is equal to

(a) $\frac{9}{2}$ (correct)

(b) $\frac{9}{4}$

(c) $\frac{7}{2}$

(d) $\frac{15}{4}$

(e) $\frac{15}{2}$

Similar to Example # 5 page 418.

13. The volume of the solid generated by revolving the region bounded by the graphs of $y = x^2$ and $y = 2x - x^2$ about the x-axis is

Similar to Q#15 (a) page #461

(a) $\frac{\pi}{3}$ (correct)

(b) $\frac{\pi}{2}$

(c) 2π

(d) 6π

(e) 3π

14. The volume of the solid generated by revolving the region bounded by the graphs of $x = y^2$ and $x = 4$ about the line $x = 5$ is given by the integral:

Q#23 page #461

(a) $2\pi \int_0^2 (24 - 10y^2 + y^4)\, dy$ (correct)

(b) $2\pi \int_0^2 (14 - 5y^2 + y^4)\, dy$

(c) $2\pi \int_0^2 (y^4 - 1)\, dy$

(d) $\pi \int_{-2}^2 (y^2 - 4)\, dy$

(e) $\pi \int_{-2}^2 (5 - y^2)^2\, dy$

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Answer KEY

Q	MASTER	CODE01	CODE02	CODE03	CODE04
1	A	A 14	A 10	C 11	B 7
2	A	A 2	B 13	C 14	C 5
3	A	B 8	E 9	B 10	E 3
4	A	C 9	A 14	C 9	D 1
5	A	A 13	A 12	D 1	E 12
6	A	E 10	C 3	B 4	D 2
7	A	A 4	B 7	C 5	C 11
8	A	D 11	D 8	D 3	A 6
9	A	A 12	E 11	E 2	A 8
10	A	B 1	B 4	A 8	C 14
11	A	A 5	B 6	D 6	D 13
12	A	A 6	D 5	E 13	C 9
13	A	E 3	A 2	B 7	E 4
14	A	C 7	E 1	C 12	E 10