1. $\int_0^{\ln 2} 2e^{-x} \sinh x \, dx =$

similar to Q60 page 380

(a) $\ln 2 - \frac{3}{8}$ (correct)

(b) $\ln 2 + \frac{3}{8}$

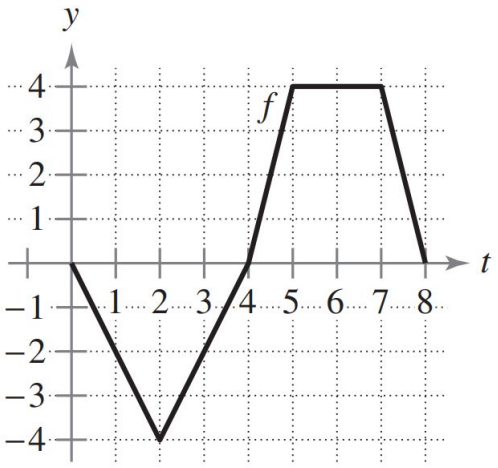
(c) $\frac{3}{8} - \ln(3)$

(d) $\ln 2 - 1$

(e) $e^2 - \ln 2$

2. Let $g(x) = \int_0^x f(t)\, dt$, where f is the function whose graph is shown in the figure.

Q66 page 329



The largest open interval, on which g is decreasing, is

(a) $(0, 4)$ (correct)

(b) $(0, 2) \cup (7, 8)$

(c) $(4, 5) \cup (7, 8)$

(d) $(2, 5)$

(e) $(5, 7)$

3. The value(s) of c guaranteed by the Mean Value Theorem for integrals for $f(x) = 5 - \dfrac{1}{x}$ over $[1, 4]$ is (are)

Q47 page 328

(a) $\dfrac{3}{\ln 4}$ (correct)

(b) $\dfrac{4}{\ln 3}$ and $\dfrac{2}{\ln 3}$

(c) $\dfrac{1}{\ln 4}$

(d) $\ln\left(\dfrac{3}{2}\right)$

(e) 1 and 4

4. $\displaystyle\int_1^9 \frac{1}{\sqrt{x}(1+\sqrt{x})^2}\,dx =$

Q79 page 342

(a) $\dfrac{1}{2}$ (correct)

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

(c) $\dfrac{1}{9}$

(d) 1

(e) 3

5. $\displaystyle\int \frac{\csc^2 x}{\cot^3 x}\,dx =$

Q43 page 341

(a) $\frac{1}{2}\sec^2 x + C$ (correct)

(b) $2\csc^2 x + C$

(c) $\cot^2 x + C$

(d) $2\sin^2 x + C$

(e) $\tan^2 x + C$

6. The area of the region enclosed by $y = \dfrac{2}{\sqrt{4-x^2}}$, $y = \dfrac{-2}{\sqrt{4-x^2}}$, $x = -1$ and $x = 1$ equals to

similar to Q63 page 371

(a) $\frac{4\pi}{3}$ (correct)

(b) $\frac{4}{5}$

(c) $4\,\pi$

(d) $\frac{2\pi}{3}$

(e) $\frac{4\sqrt{3}}{2}$

7. $\int_{-2}^{3} \frac{2dx}{x^2+4x+8} =$

Q36 page 370

(a) $\tan^{-1}\left(\frac{5}{2}\right)$ (correct)

(b) $\ln\left(\frac{3}{2}\right)$

(c) $\tan^{-1}\left(\frac{3}{2}\right)$

(d) $\tan^{-1}\left(\frac{1}{2}\right)$

(e) $2\cot^{-1}\left(\frac{3}{2}\right)$

8. The area of the enclosed region between $x = 4 - y^2$ and $x = y - 2$ is

Q29 page 450

(a) $\frac{125}{6}$ (correct)

(b) $\frac{25}{3}$

(c) $\frac{149}{5}$

(d) $\frac{65}{6}$

(e) $\frac{27}{6}$

9. Let R be the region bounded by the parabola $y = 2x - x^2$ and x-axis. If the line $y = mx$ divides the region R into two regions of equal area, then $m =$

similar to Q3 page 513

(a) $2 - \sqrt[3]{4}$ (correct)

(b) $1 - \sqrt[3]{2}$

(c) $4 - \sqrt[3]{2}$

(d) $2 - \sqrt{3}$

(e) $1 - \sqrt{3}$

10. The area of the region bounded by the graphs of $f(x) = 2\sin x$ and $g(x) = \tan x$ over the interval $\left[-\frac{\pi}{3}, \frac{\pi}{3}\right]$ is

Q39 page 451

(a) $2(1 - \ln 2)$ (correct)

(b) $2\ln 2 - 1$

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

(d) 2

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

11. If the average value of $f(x) = \dfrac{2\ln x}{x}$ over $[1, b]$ is $\dfrac{1}{e-1}$ then $b =$

Q75 page 363

(a) e (correct)

(b) $2e$

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

(d) $\dfrac{2}{e}$

(e) 1+e

12. If $\displaystyle\int_1^b \frac{2}{t}\,dt = \int_{1/e}^b \frac{1}{t}\,dt$, then $b =$

similar to Q83 page 363

(a) e (correct)

(b) $\dfrac{1}{e}$

(c) $\dfrac{1}{2}$

(d) 2

(e) $2e$

13. Let f be an odd continuous function. If $\int_0^1 f(x)\,dx = 2$ and $\int_{-1}^3 f(x)\,dx = 4$, then $\int_{-3}^1 f(x)\,dx =$

similar to Q37 page 314

(a) -4 (correct)

(b) 4

(c) 2

(d) -2

(e) 0

14. $\lim_{||\triangle||\to 0} \sum_{i=1}^{n} \sqrt{4 - c_i^2}\,\triangle x_i$ on $[0, 2]$ equals to

similar to Q12 page 313

(a) π (correct)

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

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

(d) 2π

(e) 4π

15. $\sum_{i=1}^{n}\left(\frac{2i^3-3i}{n^4}\right)-\frac{1}{n}+\frac{1}{n^2}+\frac{3}{2n^3}=$

Q28 page 303

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

(b) $\frac{1}{4}$

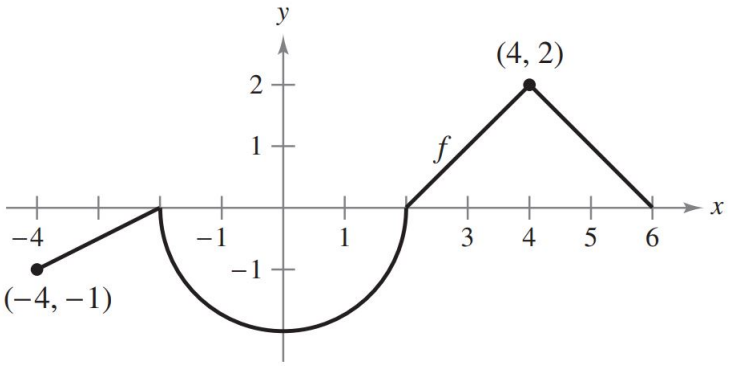
(c) $\frac{1}{3}$

(d) $\frac{1}{8}$

(e) 1

16. If the graph of f is shown in the figure,

Q51 page 314



then $\int_{-4}^{6}\left(f(x)+\frac{\pi}{5}\right)dx=$

(a) 3 (correct)

(b) 2

(c) 1

(d) 0

(e) -4

17. An approximation, for the the area between the graph of $f(x) = |\sin x|$, the x-axis, $x = -3\pi/4$ and $x = \pi/2$ using the left endpoints and 5 rectangles (of equal widths), is

similar to Q34 page 303

(a) $\left(\frac{\pi}{8}\right)\left(3\sqrt{2}+2\right)$ (correct)

(b) $\left(\frac{\pi}{4}\right)\left(3\sqrt{2}+2\right)$

(c) $\left(\frac{3\pi}{2}\right)\left(3\sqrt{2}-1\right)$

(d) $\left(3\sqrt{2}+\pi\right)$

(e) $\left(\frac{\pi}{4}\right)\left(2\sqrt{2}+1\right)$

18. The upper sum, for the region bounded by the graph of $f(x) = 6 - 2x$ on $[1, 2]$ in terms of the number of sub-intervals n, is

Q42 page 304

(a) $3 + \dfrac{1}{n}$ (correct)

(b) $3 - \dfrac{1}{n}$

(c) $3 - \dfrac{3}{n}$

(d) $3 + \dfrac{3}{n}$

(e) $3 + \dfrac{2}{3n}$