PRINTABLE VERSION

Practice Test 4

Question 1

Differentiate $y = 2\,e^{3\,x}\arcsin(x)$.

a) $2\mathrm{e}^{3x}\arcsin(x) + \dfrac{2\mathrm{e}^{3x}}{\sqrt{1-x^2}}$

b) $6\mathrm{e}^{3x}\arcsin(x) + \dfrac{2\mathrm{e}^{3x}}{\sqrt{1+x^2}}$

c) $6\mathrm{e}^{3x}\arcsin(x) + \dfrac{2\mathrm{e}^{3x}}{\sqrt{1-x^2}}$

d) $\dfrac{6\mathrm{e}^{3x}}{\sqrt{1+x^2}}$

e) $\dfrac{6\mathrm{e}^{3x}}{\sqrt{1-x^2}}$

Question 2

Differentiate the given function $y = \cosh\left(\ln\left(6x^4\right)\right)$.

a) $12x^3 - \dfrac{2}{x^4}$

b) $3x^3 + \dfrac{1}{3\,x^5}$

c) $12x^3 - \dfrac{1}{3\,x^5}$

d) $3x^3 - \dfrac{4}{x^5}$

e) $4x^3 + \dfrac{1}{3\,x^4}$

Question 3

Determine *A*, *B*, and *C* so that $y = A\cosh(Cx) + B\sinh(Cx)$ satisfies the conditions $y'' - 25y = 0,\ y(0) = 1,\ y'(0) = 2$ Take $C > 0$.

a) $[A = 5/2, B = 2, C = 5]$

b) $[A = 4, B = 2/5, C = 1]$

c) $[A = 3, B = 1/2, C = 5]$

d) $[A = 1, B = 2/5, C = 5]$

e) $[A = 5, B = 5/2, C = 0]$

Question 4

A rectangular playground is to be fenced off and divided into two parts by a fence parallel to one side of the playground. 1080 feet of fencing is used. Find the dimensions of the playground that will enclose the greatest total area.

a) 290 by 190 feet with the divider 190 feet long

b) 270 by 270 feet with the divider 270 feet long

c) 265 by 185 feet with the divider 266 feet long

d) 280 by 190 feet with the divider 280 feet long

e) 270 by 180 feet with the divider 180 feet long

Question 5

Find *A* and *B* given that the function $y = \frac{A}{\sqrt{x}} + B\sqrt{x}$ has a minimum value of 32 at x = 16.

a) A = 128 and B = 8

b) A = 128 and B = 4

c) A = 64 and B = 12

d) A = 64 and B = 4

e) A = 64 and B = 8

Question 6

Use differentials to estimate the value $(80.8)^{1/4}$.

a) $\frac{1619}{540}$

b) $\frac{1621}{540}$

c) $\frac{1349}{540}$

d) $\frac{1889}{540}$

e) $\frac{14}{5}$

Question 7

Use differentials to estimate the value $\cos(58^o)$.

a) $\frac{1}{2} + \frac{\sqrt{3}}{180}\pi$

b) $\frac{1}{2} + \frac{\sqrt{3}}{90}\pi$

c) $\frac{\sqrt{3}}{2} - \frac{1}{180}\pi$

d) $\frac{1}{2} - \frac{\sqrt{3}}{180}\pi$

e) $\frac{\sqrt{3}}{2} - \frac{1}{90}\pi$

Question 8

Find the derivative of $(8x+3)^{3x}$.

a) $\left(3\ln(8x+3) + \frac{24x}{8x+3}\right)$

b) $24x(8x+3)^{3x-1}$

c) $(8x+3)^{3x}\left(3\ln(8x+3) + \frac{24x}{8x+3}\right)$

d) $(8x+3)^{3x}\left(3\ln(8x+3) - \frac{3}{8x+3}\right)$

e) $3x(8x+3)^{3x-1}$

Question 9

Calculate the limit: $\lim_{x\to 0}\dfrac{e^{x}+e^{-x}-2}{1-\cos(5x)}$.

a) 1

b) $\dfrac{2}{25}$

c) 0

d) $\dfrac{4}{25}$

e) $\dfrac{25}{2}$

Question 10

Calculate the limit: $\lim_{x\to\infty}\left(x^{9}+1\right)^{\frac{1}{\ln(x)}}$.

a) $-e^{9}$

b) e^{10}

c) $-e^{10}$

d) e^{9}

e) 0

Question 11

Compute the upper Riemann sum for the given function $f(x) = \sin(x)$ over the interval $x \in [0, \pi]$ with respect to the partition $P = \left[0, \frac{\pi}{3}, \frac{5\pi}{6}, \pi\right]$.

a) $\frac{5}{12}\pi + \frac{\sqrt{3}}{12}\pi$

b) $\frac{17}{36}\pi + \frac{\sqrt{3}}{9}\pi$

c) $\frac{1}{4}\pi$

d) $\frac{13}{36}\pi + \frac{\sqrt{3}}{18}\pi$

e) $\frac{7}{12}\pi + \frac{\sqrt{3}}{6}\pi$

Question 12

Given that $\int_0^1 f(x)\,dx = 4, \int_0^4 f(x)\,dx = 6$ and $\int_4^5 f(x)\,dx = 3$ find $\int_5^1 f(x)\,dx$.

a) -3

b) -1

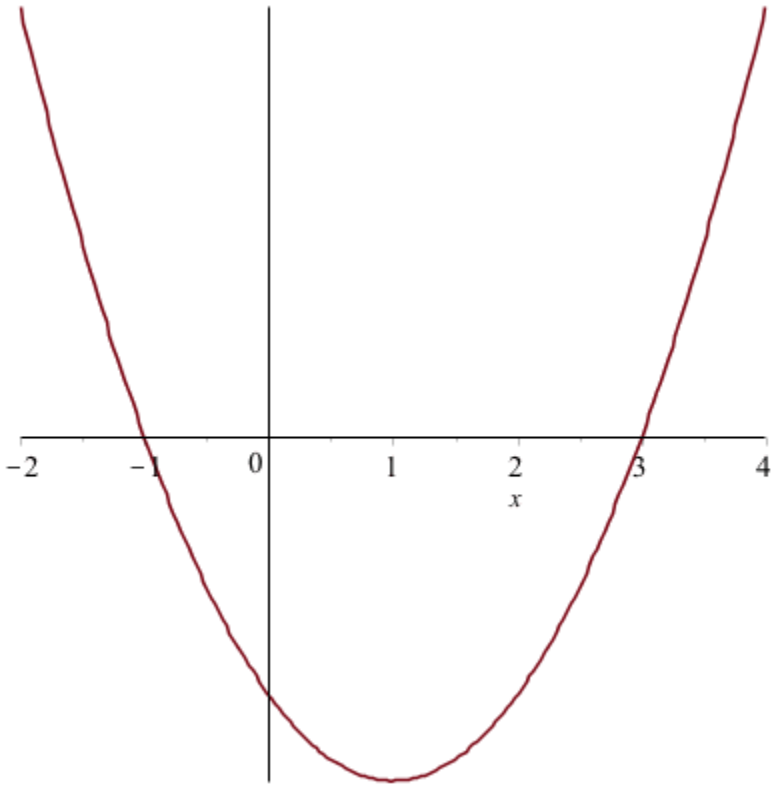
c) 5

d) 3

e) -5

Question 13

The graph of f is shown below on the interval $[-2, 4]$.



The area bounded between the graph of f and the x-axis on $[-2, -1]$ is $\frac{7}{3}$, the area bounded between the graph of f and the x-axis on $[-1, 3]$ is $\frac{32}{3}$, and the area bounded between the graph of f and the x-axis on $[3, 4]$ is $\frac{7}{3}$.

Determine $\int_{-2}^{-1} f(x)\,\mathrm{d}x$.

a) $\frac{7}{3}$

b) 0

c) $\frac{46}{3}$

d) $-\frac{7}{3}$

e) 13

Question 14

Find a formula for $f(x)$ given that f is continuous and $x^6 + x^4 + 7x = \int_0^x f(t)\,dt.$

a) $f(x) = x^6 + x^4 + 8x$

b) $f(x) = 1/7\,x^7 + 1/5\,x^5 + 7/2\,x^2 + 7$

c) $f(x) = x^6 + x^4 + 7x$

d) $f(x) = 1/7\,x^7 + 1/5\,x^5 + 7/2\,x^2$

e) $f(x) = 6x^5 + 4x^3 + 7$

Question 15

Evaluate the definite integral: $\int_1^4 |x - 3|\,dx$

a) -1

b) $\frac{5}{2}$

c) $\frac{33}{2}$

d) $-\frac{111}{2}$

e) $-\frac{3}{2}$

Question 16

Find $\int_{-3}^{4} f(x)\,dx$ given that $f(x) = \begin{cases} x+2 & -3 \le x \le 0 \\ 2 & 0 < x \le 1 \\ 4-2x & 1 < x \le 4 \end{cases}$

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

b) -3

c) $\frac{35}{2}$

d) -21

e) 21

Question 17

Calculate the indefinite integral: $\int \frac{2\,x^3 - 5}{x^2}\,dx.$

a) $x^2 + \frac{5}{x} + C$

b) $x^2 - 5x + C$

c) $6 - \frac{4\,x^3 - 10}{x^3} + C$

d) $\frac{2}{3}x^3 - 5x + C$

e) $2x + \frac{5}{x} + C$

Question 18

Calculate the indefinite integral: $\int \left(5x^3 + 2\sqrt{x} + \frac{1}{x^3}\right) dx.$

a) $15x^2 + \frac{1}{\sqrt{x}} - \frac{3}{x^4} + C$

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

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

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

e) $\frac{5}{4}x^4 - \frac{4}{3}x^{3/2} - \frac{1}{2x^2} + C$

Question 19

Find f givent that $f'(x) = 4x - 6$ and $f(1) = 1$.

a) $f(x) = 4x - 1$

b) $f(x) = 4x + 2$

c) $f(x) = 2x^2 - 6x + 5$

d) $f(x) = 2x^2 - 6x + 8$

e) $f(x) = 2x^2 - 6x + 2$

Question 20

Calculate: $\int \sec(2\,x + 4)\tan(2\,x + 4)\,dx$

a) $\frac{1}{2}\sec(2x + 4)\tan(2x + 4) + C$

b) $\frac{1}{2}\sec(2x + 4) + C$

c) $\frac{1}{2}\tan(2x + 4) + C$

d) $2\tan(2x + 4) + C$

e) $2\sec(2x + 4) + C$