



19

Evaluate the indicated integral.

$$\int \frac{e^{\sqrt{x}}}{\sqrt{x}} dx$$

أوجد قيمة التكامل غير المحدود.

$$\int \frac{e^{\sqrt{x}}}{\sqrt{x}} dx$$

a. $\frac{1}{2e^{\sqrt{x}}} + c$

b. $\frac{1}{2}e^{\sqrt{x}} + c$

c. $\frac{2}{e^{\sqrt{x}}} + c$

d. $2e^{\sqrt{x}} + c$

20

If the cost of manufacturing x items

$$\text{is } C(x) = x^3 + 20x^2 + 90x + 15$$

Find the marginal cost at $x = 30$.إذا كانت تكلفة تصنيع x منتج هي

$$C(x) = x^3 + 20x^2 + 90x + 15$$

أوجد التكلفة الحدية عند $x = 30$.

a. $C'(30) = 4005$

b. $C'(30) = 2190$

c. $C'(30) = 3990$

d. $C'(30) = 3390$

Q	Learning Outcome	Example/Exercise	Page
1	Find the critical points of a given function	3-6 Part1	258
$f(x) = -x^3 + 3x^2 - 3x$ has critical number at			
A	X=1 ; it is neither local min nor max.	B	X=1 ; it is local min.
C	X=1 ; it is local max.	D	X=2 ; it is local max.

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Q	Learning Outcome	Example/Exercise	Page
2	Find the critical points of a given function	7-22Part1	258

$f(x) = x^4 + 6x^2 - 2$ has critical number at

A	X=0 ; it is neither local min nor max.	B	X=0 ; it is local min.	C	X=0 ; it is local max.	D	X=1 ; it is local max.
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Q	Learning Outcome	Example/Exercise	Page
3	Find the critical points of a given function	7-22Part1	258

$y = x e^{-2x}$ has

A	a local maximum at $x = \frac{1}{2}$	B	a local maximum at $x = -\frac{1}{2}$	C	a local maximum at $x = -2$	D	a local maximum at $x = 2$
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Q	Learning Outcome	Example/Exercise	Page
4	Determine the concavity of a function using the first and second derivatives	9-14Part1	276

Find all critical numbers and use the Second Derivative Test to determine all local extrema.

$y = x^4 + 4x^3 - 1$ has

A	a local minimum at $x = -3$	B	a local maximum at $x = -3$	C	a local minimum at $x = 0$	D	a local maximum at $x = 0$
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Q	Learning Outcome	Example/Exercise	Page
5	Sketch the graph of a given function using its properties and its first and second derivative	11-21Part1	286

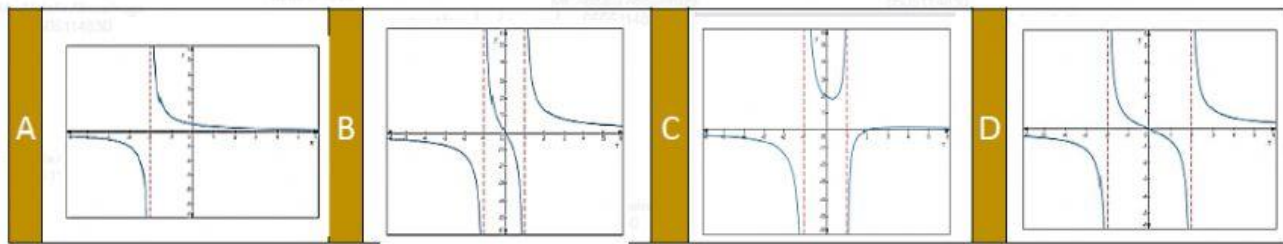
Determine the graph of the function $f(x) = \frac{3x^2}{x^2+1}$

A		B		C		D	
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Q	Learning Outcome	Example/Exercise	Page
6	Sketch the graph of a given function using its properties and its first and second derivative	Exam 2021.2022 (1-10) Part1	286

Determine the graph of the function $f(x) = \frac{-2x}{x^2-1}$



Q	Learning Outcome	Example/Exercise	Page
7	Find the antiderivative of a given function	5-20Part1	329

Find the antiderivative of a given function

$$\int (3\cos x - \sin x) dx =$$

A	$3 \sin x + \cos x + c$	B	$3 \sin x - \cos x + c$	C	$-3 \sin x + \cos x + c$	D	$-3 \sin x - \cos x + c$
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Q	Learning Outcome	Example/Exercise	Page
8	Find the antiderivative of a given function	5-20Part1	329

Find the antiderivative of a given function

$$\int 4 \frac{\cos x}{\sin^2 x} dx =$$

A	$-4\sec x + c$	B	$-4\csc x + c$	C	$4\csc x + c$	D	$4\sec x + c$
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Q	Learning Outcome	Example/Exercise	Page
9	Find the antiderivative of a given function	21-29Part1	329

Find the general antiderivative

$$\int \frac{4x}{x^2 + 4} dx =$$

A	$\frac{1}{2} \ln x^2 + 4 + c$	B	$\frac{1}{4} \ln x^2 + 4 + c$	C	$2 \ln x^2 + 4 + c$	D	$4 \ln x^2 + 4 + c$
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Q	Learning Outcome	Example/Exercise	Page
10	Learn the properties of definite integrals	9-14Part1	356

Evaluate the integral by computing the limit of Riemann sums:

$$\int_0^2 x^2 dx$$

A	$\frac{8}{3}$	B	$\frac{4}{3}$	C	8	D	4
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Q	Learning Outcome	Example/Exercise	Page
11	Find the critical points of a given function	3-6 Part2	258

Find all critical numbers

$$f(x) = x^2 + 5x - 1 \text{ has}$$

A	a local minimum at $x = -5/2$	B	a local maximum at $x = 3/2$	C	a local minimum at $x = 3/2$	D	a local maximum at $x = -5/2$
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Q	Learning Outcome	Example/Exercise	Page
12	Find the absolute extrema of a given function	7-12 Part2	258

Find the absolute extrema of the given function on the indicated interval.

$$f(x) = x^3 - 3x + 1$$

On $[0, 2]$.

A	-1 abs Mini, 3 abs Max	B	-1 abs Max, 3 abs Mini	C	1 abs Mini, -3 abs Max	D	-1 abs Mini, -3 abs Max
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Q	Learning Outcome	Example/Exercise	Page
13	Identify increasing and decreasing functions	Exam 2021.2022	11-20 Part2

Find the x -coordinate of the local Maximum of

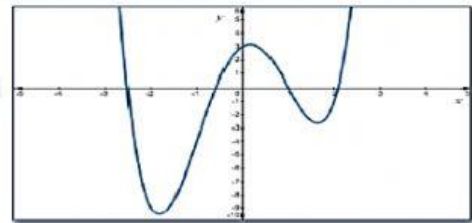
$$y = x^2 e^{-x}$$

A	$x = -\frac{1}{2}$	B	$x = 0$	C	$x = 2$	D	$x = -2$
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Q	Learning Outcome	Example/Exercise	Page
14	Learn the notion of an Inflection Point and find one Exam 2021.2022	1-8 Part2	276

Determine where the graph of $f(x) = x^4 - 6x^2 + 2x + 3$ is concave up



A	$(-\infty, 0) \cup (0, \infty)$	B	$(-\infty, -1)$	C	$(-1, 1)$	D	$(-\infty, -1) \cup (1, \infty)$
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Q	Learning Outcome	Example/Exercise	Page
15	Use the sigma notation to compute basic summation	19-22 Part2	337

Compute the sum of the form $\sum_{i=1}^n f(x_i) \Delta x$ for the given values of x_i

$$f(x) = x^2 + 4x, \quad x_i = 0.2, 0.4, 0.6, 0.8, 1.0;$$

$$\Delta x = 0.2; n = 5$$

A	2.84	B	3.84	C	4.48	D	5.48
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Q	Learning Outcome	Example/Exercise	Page
16	Estimate the area under a curve on a given interval using rectangles Exam 2021.2022	35-38 Part2	345

Use the given function values in the table below to estimate the area under the curve using left - endpoint evaluation.

x	0.0	0.1	0.2	0.3	0.4
f(x)	2.0	2.4	2.6	2.7	2.6

A	1.03	B	9.7	C	0.97	D	10.3
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Q	Learning Outcome	Example/Exercise	Page
17	Understand the notion of a definite integral Exam 2021.2022	15-20 Part2	365

Write the given (total) area as an integral or sum of integrals.

The area above the x-axis and below $y = 4 - x^2$

A	$\int_0^2 -(4 - x^2) dx$	B	$\int_{-2}^2 (4 - x^2) dx$	C	$\int_0^2 (4 - x^2) dx$	D	$\int_{-2}^2 -(4 - x^2) dx$
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Q	Learning Outcome	Example/Exercise	Page
18	Apply the Integral Mean Value Theorem	29-34 Part2	356

Find the value of c that satisfy the conclusion of the Integral Mean Value Theorem

$$\int_0^2 3x^2 dx = 8$$

A	$c = \frac{2\sqrt{3}}{3}$	B	$c = -\frac{2\sqrt{3}}{3}$	C	$c = \pm \frac{2\sqrt{3}}{3}$	D	$c = \pm 3$
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Q	Learning Outcome	Example/Exercise	Page
19	Learn the properties of definite integrals	37-38 Part2	356

Assume that $\int_1^3 f(x) dx = 3$ and $\int_1^3 g(x) dx = -2$ find $\int_1^3 [4f(x) - 3g(x)] dx$

A	1	B	-1	C	17	D	-17
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Q	Learning Outcome	Example/Exercise	Page
20	Learn the Fundamental Theorem of Calculus (Part I) and use it to compute various definite integrals	5-18 Part2	366

Use Part I of the Fundamental Theorem to compute the integral exactly.

$$\int_0^2 \frac{e^{2x} - 2e^{3x}}{e^{3x}} dx$$

A	$-\frac{1}{e^2} - 3$	B	$\frac{1}{e^2} - 3$	C	$\frac{1}{e^2} + 3$	D	$-\frac{1}{e^2} + 3$
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Q	Learning Outcome	Example/Exercise	Page
21	Compute integrals using substitution	Exam 2021.2022	376

Evaluate the indicated integral. $\int \frac{e^{\sqrt{x}}}{\sqrt{x}} dx$

A	$\frac{1}{2e^{\sqrt{x}}} + c$	B	$\frac{1}{2}e^{\sqrt{x}} + c$	C	$\frac{2}{e^{\sqrt{x}}} + c$	D	$2e^{\sqrt{x}} + c$
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Q	Learning Outcome	Example/Exercise	Page
22	Compute integrals using substitution	17-26 Part2	376

Evaluate the indicated integral. $\int \frac{x^2}{1+x^6} dx$

A	$\frac{1}{3} \tan^{-1} x^3 + c$	B	$\frac{1}{3} \sin^{-1} x^3 + c$	C	$\frac{1}{3} \cos^{-1} x^3 + c$	D	$3 \tan^{-1} x^3 + c$
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Abdulkader Amro