Calculus

Chapter 5: Integration

Lesson 5: Integration by Substitution

Question #1

Reference Q.447
For the following question, evaluate the integral using the recommended substitution.
$\int 3x^2 \left(x^3 - 2\right)^{11} dx; \;\; u = x^3 - 2$

Question #2

Reference Q.448
For the following question, evaluate the integral using the recommended substitution.
$\int \frac{3}{\sqrt{x}} e^{\sqrt{x}} \, dx; u = \sqrt{x}$

Question #3

Reference Q.449
For the following question, evaluate the integral using the recommended substitution.
$\int \frac{\cos x}{\sin^2 x}; \;\; u = \sin x$

Question #4

Reference Q.450
For the following question, evaluate the integral using the recommended substitution.
$\int \csc^2 (3x - 2) dx; \;\; u = 3x - 2$

Question #5

Reference Q.451
For the following question, evaluate the integral using the recommended substitution.
$\int \frac{7 \, dx}{\sqrt{3x - 10}}; \;\; u = 3x - 10$

Question #6

Reference Q.452
For the following question, evaluate the integral.
$\int 3x \sqrt{(7 - x^2)} dx; \;\; u = 7 - x^2$

Question #7

Reference Q.453
For the following question, evaluate the integral.
$\int (\cos x \; + 5)^7 \sin x \, dx$

Question #8

Reference Q.454
Evaluate:
$\int e^{\sin x} \cos x \, dx$

Question #9

Reference Q.456
Evaluate:
$\int \cos 5x \, dx$

Question #10

Reference Q.455
Evaluate:
$\int (3x + 4)^{17} dx$

Question #11

Reference Q.457
Evaluate:
$\int \tan^2 \left(\frac{x}{3}\right) \sec^2 \left(\frac{x}{3}\right) \, dx$

Question #12

Reference Q.458
Evaluate:
$\int e^{7x} dx$

Question #13

Reference Q.459
Evaluate:
$\int \frac{(1 - \sqrt{x})^4}{\sqrt{x}} \, dx$

Question #14

Reference Q.460
Evaluate:

$$\int \frac{\sin\left(1+\frac{1}{x}\right)}{x^2}\,dx$$

Question #15

Reference Q.461
Evaluate:

$$\int \frac{\sin(3x-1)}{\cos^7(3x-1)}\,dx$$

Question #16

Reference Q.462
Evaluate:

$$\int \frac{m^7\,dm}{(5m^8+3)}$$

Question #17

Reference Q.463
Evaluate:

$$\int 6xe^{5x^2-1}\,dx$$

Question #18

Reference Q.464
Evaluate:

$$\int \frac{e^x}{\sqrt{1-e^{2x}}}dx$$

Question #19

Reference Q.465
Evaluate:

$$\int \frac{5\cos 2\sqrt{x}}{\sqrt{x}}\,dx$$

Question #20

Reference Q.466
Evaluate:

$$\int x^3\sec^2(2-x^4)\,dx$$

Question #21

Reference Q.467
Evaluate:

$$\int \frac{7\sin\sqrt{x}}{\sqrt{x}(2+\cos\sqrt{x})^2}\,dx$$

Question #22

Reference Q.468
Evaluate:

$$\int \sec^9 4x\tan 4x\,dx$$

Question #23

Reference Q.469
Evaluate:

$$\int x^{2/3}\sec^2 x^{5/3}\,dx$$

Question #24

Reference Q.470
(Try this!)
Evaluate:

$$\int 3x\sqrt{12-x}\,dx$$

Question #25

Reference Q.471
(Try this!)
Evaluate:

$$\int (x+2)(x-1)^9\,dx$$

Question #26

Reference Q.472
Evaluate:

$$\int \frac{33+4x}{x}dx$$

Question #27

Reference Q.473
Evaluate:

$$\int \frac{x+2}{x^7}\,dx$$

Question #28

Reference Q.474

Evaluate:

$\int \frac{dx}{5+x^2}$

Question #29

Reference Q.475

Evaluate:

$$\int \frac{3}{1+4x^2}\,dx$$

Question #31

Reference Q.9234

Evaluate: $\int \frac{x^4}{e^{x^5}}\,dx$

Question #32

Reference Q.9235

Evaluate: $\int \frac{\cos x+1}{\sqrt{\sin x+x+2}}\,dx$

Question #33

Reference Q.9236

Evaluate:

$$\int \frac{dx}{\sqrt{9-x^2}}$$

Question #30

Reference Q.476

Evaluate:

$$\int \frac{dx}{x\sqrt{x^2-e^2}}$$

Question #34

Reference Q.9237

Evaluate:

$$\int \frac{3x^2+2x-1}{(x+1)^2(x-1)}\,dx$$

Question #35

Reference Q.66279

AP Prep: Evaluate the following integral: $\int \frac{x+2}{x^2+4x}dx$ Hint: Complete the square on the denominator.