

KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

DEPARTMENT OF MATHEMATICS & STATISTICS

MATH102 - Section 22 (Term 172)

Date: March 20, 2018

Test 3

Duration: 50 minutes

Family Name: _____ ID #: 201_____0 Serial #: ____

1. Find the average value of the function

$$f(x) = x^2 e^{(x^3)}$$

on the interval $[1, 3]$.

(6 points)

2. Find the value of the constant $c > 0$, if the average value of the function

$$f(x) = x^2 + 2x - 1$$

over the interval $[0, c]$ is 5.

(6 points)

3. Evaluate the following integrals:

(a) $\int \cos(3x) \cos(4x) dx$

(b) $\int \sec^6 x \tan^3 x dx$

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

$$(d) \int \frac{x}{\sqrt{x^2+4x-5}} dx$$

(6 + 6 + 7 + 7 = 26 points)

4. Use Integration by Parts to evaluate the following integrals:

(a) $\int \frac{1}{\sqrt{x}} \ln x \, dx$

(b) $\int (x^3 + 1) e^{-x} \, dx$

(6 + 6 = 12 points)

KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

DEPARTMENT OF MATHEMATICS & STATISTICS

MATH102 - Section 28 (Term 172)

Date: March 20, 2018

Test 3

Duration: 50 minutes

Family Name: _____ ID #: 201_____0 Serial #: ____

1. Find the average value of the function

$$f(x) = \frac{1}{x^2} e^{-1/x}$$

on the interval $[1, 3]$.

(6 points)

2. Find the value of the constant c , such that the average value of the function

$$f(x) = x^2 + 2x - 1$$

over the interval $[0, 3]$ is $f(c)$.

(6 points)

3. Evaluate the following integrals:

(a) $\int \cos(3x) \sin(4x) dx$

(b) $\int \sin^7 x \cos^5 x dx$

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

$$(d) \int \frac{x}{\sqrt{3-x^2+2x}} dx$$

(6 + 6 + 7 + 7 = 26 points)

4. Use Integration by Parts to evaluate the following integrals:

(a) $\int (x^2 + 1) \ln x \, dx$

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

(6 + 6 = 12 points)

KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

DEPARTMENT OF MATHEMATICS & STATISTICS

MATH102 - Section 36 (Term 172)

Date: March 20, 2018

Test 3

Duration: 50 minutes

Family Name: _____ ID #: 201_____0 Serial #: _____

1. Find the average value of the function

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

on the interval $[3, 5]$.

(6 points)

2. Find the value of the constant $c > 0$, if the average value of the function

$$f(x) = x^2 + 2x - 1$$

over the interval $[0, c]$ is 5.

(6 points)

3. Evaluate the following integrals:

(a) $\int \sin(3x) \sin(2x) dx$

(b) $\int \sec^6 x \tan^2 x dx$

$$(c) \int \frac{\sqrt{x^2 - 4}}{x} dx$$

$$(d) \int \frac{1}{x \sqrt{x^2 + 4}} dx$$

(6 + 6 + 7 + 7 = 26 points)

4. Use Integration by Parts to evaluate the following integrals:

(a) $\int x^3 \ln x \, dx$

(b) $\int x^3 e^x \, dx$

(6 + 6 = 12 points)