

NAME: ~~XXXXXXXXXXXXXXXXXXXX~~

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SEC: 1---2---3---4---5---6---7---8---9---10

1..c 5..c 9..b 13..c
 2..d 6..c 10..a 14..d
 3..b 7..a 11..b 15..b
 4..a 8..d 12..d 16..a

RESERVED For CORRECTOR
 CORRECT: ... 14 x 5 = 70
 WRONG: ... 2 x (-1) = -2
 PART I GRADE: 68
 PART II GRADE: 18
 QUIZ II GRADE: 86

PART I For the following 16 questions, use the ANSWER TABLE (above) and fill in your choice of the correct letter a,b,c,d or e:

Given the following data set : 8,10,14,14,25,27,31,31,31,49 Answer questions 1-2-3-4 .

1. The mean is :
 a. 18.7 b. 26 **c. 24** d. 19.2
2. The median is:
 a. 41 b. 31 c. 21 **d. 26**
3. The range is :
 a. 51 **b. 41** c. 21 d. 49
4. The mode is:
a. 31 b. 14 c. 41 d. 10

Given a normally distributed random variable , with mean 65 and standard deviation 2.4 . Answer questions 5 and 6.

5. Find $P(64.4 < X < 68.6)$.
 a. 0.3345 b. 0.4332 **c. 0.5319** d. 0.6521
6. To the left of what value of X is the area under the normal curve equal to 0.0170?
 a. 49.912 b. 59.912 **c. 70.088** d. 60.088

PART II Answer in the space provided:

I. Evaluate: $I = \int (4x + \frac{5}{x} - \frac{6}{x^3}) dx$

$$\begin{aligned} I &= \int 4x dx + \int \frac{5}{x} dx - \int \frac{6}{x^3} dx \\ &= \frac{4x^2}{2} + 5 \ln x - \frac{6x^{-2}}{(-2)} \\ &= 2x^2 + 5 \ln x + \frac{3}{x^2} + C \end{aligned}$$

II. Evaluate: $K = \int \frac{-(e^{-x} + \frac{1}{x}) dx}{(e^{-x} - \ln x)^5}$

$$K = \int \frac{(e^{-x} + \frac{1}{x}) dx}{(e^{-x} - \ln x)^5}$$

The derivative of $(e^{-x} - \ln x)$ is $-e^{-x} - \frac{1}{x}$

So we multiply by (-1)

$$K = \int \frac{du}{u} =$$

$$= -\ln(e^{-x} - \ln x) + C$$

Consider the following probability distribution table:

X	P(X)
40	0.3
50	0.5
60	0.1
70	0.1

Answer questions 7 and 8.

7. What is the mean of the distribution?
 a. 50 b. 55 c. 52 d. 54
8. What is the standard deviation?(Answer is rounded).
 a. 5.3 b. 80 c. 7.8 d. 8.9

Four dice of different colors are thrown. Answer the questions 9-10-11

9. What is the probability that there will be exactly two fives?
 a. 5/216 b. 25/216 c. 1/36 d. 5/36
10. What is the mean number of fives expected to be?
 a. 2/3 b. 2 c. 3/2 d. 1/6
11. What is the standard deviation of the number of fives expected to be?(Answer is rounded).
 a. 0.55 b. 0.65 c. 0.75 d. 0.45

12. The function describing the marginal profit from producing and selling a product is:

$$MP = -2x + 800$$

Where x equals the number of units and MP is the marginal profit measured in dollars. When 100 items are produced and sold, total profit equals \$85,000. Determine the profit when 200 items are produced and sold.

- a. \$120,000 b. \$125,000 c. \$130,000 d. \$135,000

3. The value of an asset is estimated by the function :

$$V = 10,000e^{-0.05t}$$

Where V is the value of the asset in dollars and t is the age in years. Then the instantaneous rate of change in the value of the asset, when the asset is 10 years old, is expected to be about:

- a. -722 b. -264 c. -303 d. -455

Given the function: $f(x) = (x+4)^2 e^{-3x}$. Answer questions 14 and 15.

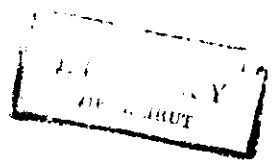
14. Find $f'(-1)$.
 a. $-6e^3$ b. $17e^3$ c. $21e^3$ d. $-21e^3$
15. Determine x so that $f'(x) = 0$.
 a. 5, -6/5 b. -4, -10/3 c. 8, -2/3 d. 4, -3/2

16. If $y=f(u)=u^2+4u$ and $u=g(x)=1/x$, then dy/dx at $x=1/2$ will be:

- a. -32 b. -64 c. 19/4 d. -51/2

$$\frac{dy}{dx} = \frac{dy}{du} \cdot \frac{du}{dx}$$

III. Evaluate: $J = \int x^{\frac{4}{5}} \ln x dx$



$$u = \ln x \quad dv = x^{\frac{4}{5}}$$

$$du = \frac{1}{x} \quad v = \frac{5}{9} x^{\frac{9}{5}}$$

$$J = uv - \int v du$$

$$= \ln x \left(\frac{5}{9} x^{\frac{9}{5}} \right) - \int \frac{5}{9} x^{\frac{9}{5}} \cdot \left(\frac{1}{x} \right) dx$$

$$= \frac{5}{9} x^{\frac{9}{5}} \ln x - \frac{5}{9} \int x^{\frac{4}{5}} dx$$

$$= \frac{5}{9} x^{\frac{9}{5}} \ln x - \frac{5}{9} \cdot \frac{5}{9} x^{\frac{9}{5}} = \frac{5}{9} x^{\frac{9}{5}} \ln x - \frac{25}{81} x^{\frac{9}{5}} + C$$

IV. Evaluate: $\int \frac{x}{\sqrt{x+3}} dx$

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

$$u = x \quad dv = \frac{1}{\sqrt{x+3}}$$

$$du = 1 \quad v = 2\sqrt{x+3}$$

$$uv - \int v du$$

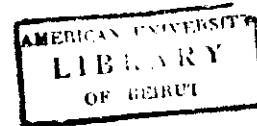
$$= (x)(2\sqrt{x+3}) - \int 2\sqrt{x+3} dx$$

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

$$= 2x\sqrt{x+3} - 2 (x+3)^{\frac{3}{2}} \cdot \left(\frac{2}{3} \right) + C$$

$$= 2x\sqrt{x+3} - \frac{4}{3} (x+3)^{\frac{3}{2}} + C$$

4. (14%) Find the area bounded by: $y = x^2 - 4$, $y = 3x$, and the x -axis, with $x > 0$.
(Graph and shade the required region)



5. (12%) A woman has 12 friends, 8 women and 4 men.
- a) In how many ways can she invite 8 of them to dinner?
- b) In how many ways can she invite 5 women and 4 men?