Quiz#1

Multiple Choice
Identify the choice that best completes the statement or answers the question.

_____ 1. Approximate the area under the curve $y = \sin x$ from 0 to $\dfrac{\pi}{2}$ using ten approximating rectangles of equal widths and right endpoints. The choices are rounded to the nearest hundredth.

    a. 0.36
    b. 0.02
    c. 0.72
    d. 0.98
    e. 1.08

_____ 2. Use the Midpoint Rule with $n = 10$ to approximate the integral.

$$\int_1^2 \sqrt{4 + t^2}\, dt$$

    a. 7.510716
    b. 1.510716
    c. 12.510716
    d. 2.510716
    e. 10.510716

_____ 3. Use Part 1 of the Fundamental Theorem of Calculus to find the derivative of the function.

$$h(x) = \int_1^{\sqrt{x}} \frac{z^2}{z^4 + 1}\, dz$$

    a. $\dfrac{\sqrt{x+1}}{x^2 + 2}$

    b. $\dfrac{\sqrt{x^2 + 1}}{2}$

    c. none of these

    d. $\dfrac{\sqrt{x}}{x^2 + 1}$

    e. $\dfrac{\sqrt{x}}{2\left(x^2 + 1\right)}$

_____ 4. An animal population is increasing at a rate of $16 + 51t$ per year (where t is measured in years). By how much does the animal population increase between the fourth and tenth years?

    a. 2248
    b. 2288
    c. 2338
    d. 2258
    e. 2238

_____ 5. The velocity function (in meters per second) is given for a particle moving along a line. Find the distance traveled by the particle during the given time interval.

$v(t) = 8t - 8, \ 0 \le t \le 5$

    a. 36 m
    b. 72 m
    c. 100 m
    d. 64 m
    e. 68 m

Numeric Response

1. The speed of a runner increased steadily during the first three seconds of a race. Her speed at half-second intervals is given in the table. Find a lower estimate for the distance that she traveled during these three seconds.

t(s)	0	0.5	1.0	1.5	2.0	2.5	3.0
(ft/s)	0	2.8	3.5	6.9	8.2	12.2	16.3

2. Find an expression for the area under the graph of f as a limit. Do not evaluate the limit.

$f(x) = \sqrt{\tan x}, \ 0 \le x \le \pi$

3. Find an expression for the area under the graph of f as a limit. Do not evaluate the limit.

$f(x) = x^2 + \sqrt{1 + 2x}, \ 4 \le x \le 7$

Quiz#1
Answer Section

MULTIPLE CHOICE

1. ANS: E   PTS: 1   DIF: Medium   REF: 5.1.3a
   MSC: Bimodal   NOT: Section 5.1
2. ANS: D   PTS: 1   DIF: Medium   REF: 5.2.10
   MSC: Bimodal   NOT: Section 5.2
3. ANS: E   PTS: 1   DIF: Medium   REF: 5.3.17
   MSC: Bimodal   NOT: Section 5.3
4. ANS: E   PTS: 1   DIF: Medium   REF: 5.4.64
   MSC: Bimodal   NOT: Section 5.4
5. ANS: E   PTS: 1   DIF: Medium   REF: 5.4.59
   MSC: Bimodal   NOT: Section 5.4

NUMERIC RESPONSE

1. ANS: 16.8

   PTS: 1   DIF: Medium   REF: 5.1.13   MSC: Numerical Response
   NOT: Section 5.1

2. ANS: $\lim\limits_{n \to \infty} \sum\limits_{i=1}^{n} \left[\sqrt{\tan\left(\frac{\pi i}{n}\right)} \right] \cdot \frac{\pi}{n}$

   PTS: 1   DIF: Medium   REF: 5.1.21   MSC: Numerical Response
   NOT: Section 5.1

3. ANS: $\lim\limits_{n \to \infty} \sum\limits_{i=1}^{n} \left[\left(4 + \frac{3i}{n}\right)^2 + \sqrt{1 + 2\left(4 + \frac{3i}{n}\right)} \right] \cdot \frac{3}{n}$

   PTS: 1   DIF: Medium   REF: 5.2.20   MSC: Numerical Response
   NOT: Section 5.2

_E_   4.

_E_   1.

_E_   5.

_D_   2.

_E_   3.