Vietnam National University of Agriculture
Department of Mathematics

October 17, 2016

MIDTERM EXAM MATH 17A- No.1
Duration 50 minutes

Unauthorized materials

Exercise 1. Suppose that the size of population is given by

$$N(t) = \frac{300t}{3+t},\ t \geq 0.$$

a) [1.0 pt] Determine the size of population as $t \to +\infty$. We call this the limiting population size.

b) [1.0 pt] When the size of population is half its limiting size?

Exercise 2. [1.0 pt] Use the intermediate value theorem to conclude that the equation

$$\sin x = x$$

has a solution in $(-1, 1)$.

Exercise 3. [1.0 pt] Find the derivative of the following functions

$$f(x) = \frac{\sin(2x+1)}{\sqrt{x}}.$$

Exercise 4. An object moves along a straight line. Its location at time t is given by

$$s = s(t) = t\sqrt{4-t}, 0 \leq t \leq 4.$$

a) [1.0 pt] Find its average velocity between $t = 1$ and $t = 3$.

b) [1.0 pt] Find its velocity at time $t = 3$.

c) [1.0 pt] When its velocity is zero?

d) [1.0 pt] Find the longest distance of the object from the initial position.

e) [2.0 pt] Examine the monotonicity and then draw the graph of $s = s(t)$.

Edited by Quang Sang Phan
http://www.vnua.edu.vn/khoa/fita/pqsang/

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MIDTERM EXAM MATH 17A- No.2
Duration 50 minutes

Unauthorized materials

Exercise 1. Suppose that the size of population is given by

$$N(t) = \frac{400t}{5+t},\ t \geq 0.$$

a) [1.0 pt] Determine the size of population as $t \to +\infty$. We call this the limiting population size.

b) [1.0 pt] When the size of population is one third of its limiting size?

Exercise 2. [1.0 pt] Use the intermediate value theorem to conclude that the equation

$$\cos x = x$$

has a solution in $(0, 1)$.

Exercise 3. [1.0 pt] Find the derivative of the following functions

$$f(x) = \frac{\sin x}{\sqrt{2x+1}}.$$

Exercise 4. An object moves along a straight line. Its location at time t is given by

$$s = s(t) = t\sqrt{6-t}, 0 \leq t \leq 6.$$

a) [1.0 pt] Find its average velocity between $t = 1$ and $t = 4$.

b) [1.0 pt] Find its velocity at time $t = 3$.

c) [1.0 pt] When its velocity is zero?

d) [1.0 pt] Find the longest distance of the object from the initial position.

e) [2.0 pt] Examine the monotonicity and then draw the graph of $s = s(t)$.

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