Final Review

Final Exam is Wednesday 4-5:50pm in **MNB 104**.

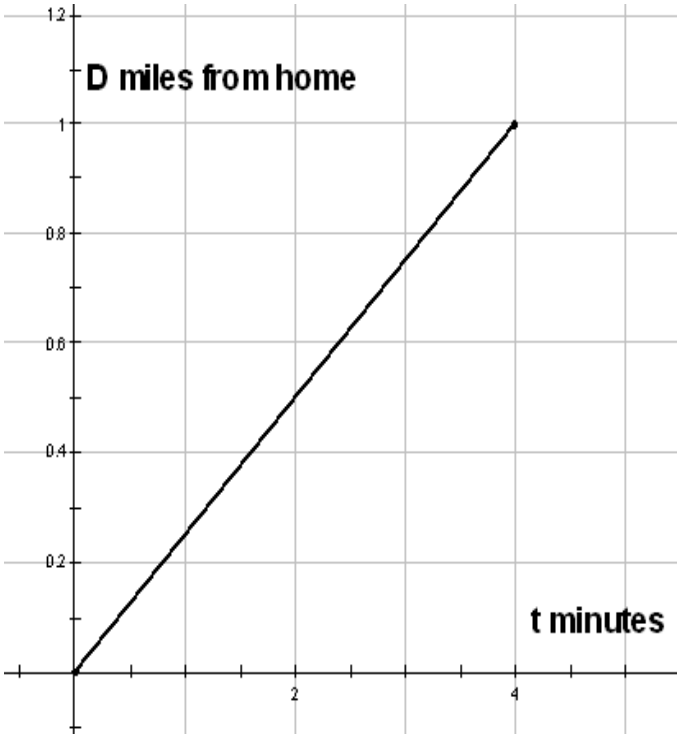
Question 1

What is the antiderivative of

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

Question 2

How fast is Eugene going in mph?



t	0	4
D	0	1

Question 3

What is the average rate of change from x=2 to x=5 of the function $y = 2x^2 + 1$?

Question 4

What is the instantaneous rate of change at x=3 of $y = 2x^2 + 1$?

Question 5

Find the derivative. Write answer with positive exponents.

$$f(x) = \frac{3}{x}$$

Question 6

Find the derivative. Write answer with positive exponents.

$$f(x) = 5\sqrt{x}$$

Question 7

Find the derivative. Write answer with positive exponents.

$$f(x) = \sqrt{3x^2 + 2}$$

Question 8

Find the derivative. You do not need to simplify.

$$f(x) = (2x+5)^{10}(x-3e^{2x})$$

Question 9

Find the derivative. You do not need to simplify.

$$f(x) = \frac{5\sin(x) - 2x^3}{2x - 1}$$

Question 10

Evaluate. Write answer without negative exponents.

$$\int 2\sqrt{x}dx$$

Question 11

Evaluate

$$\int_0^1 \left(x^4 - \frac{1}{2}x \right) dx$$

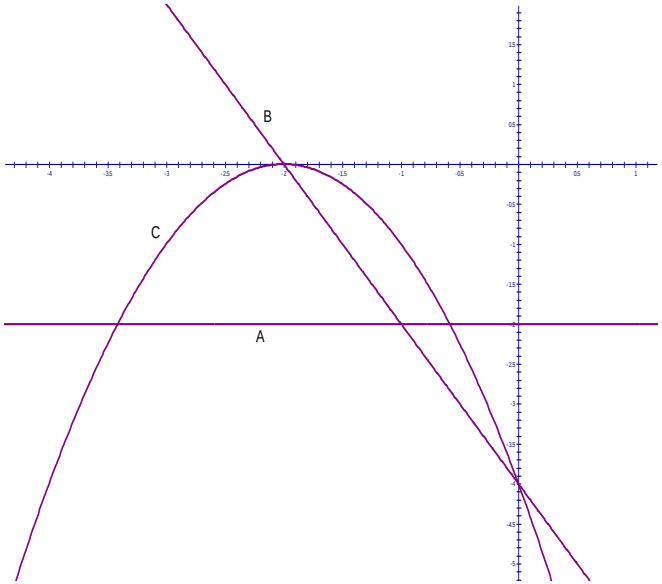
Question 12

Evaluate. Write answer without negative exponents.

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

Question 13

A is the flat line, B is the negatively sloped line and C is the curve. Describe the function / derivative relationship between the three functions.



Question 14

A ball is thrown into the air. The height of the ball in feet is given by the following function: $h(t) = -16t^2 + 44t + 12$.

How fast is the ball going at 3 seconds? Is it going up or down?

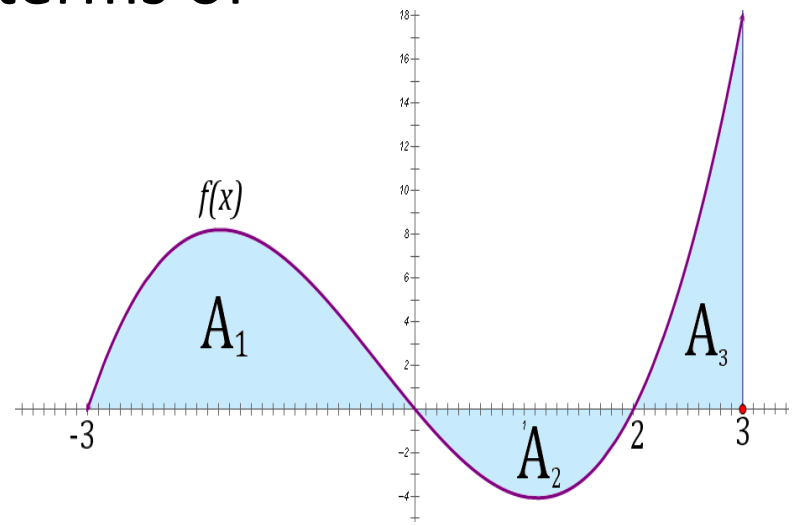
Question 15

A ball is thrown into the air. The height of the ball in feet is given by the following function: $h(t) = -16t^2 + 44t + 12$.

How fast is the ball going when it hits the ground?

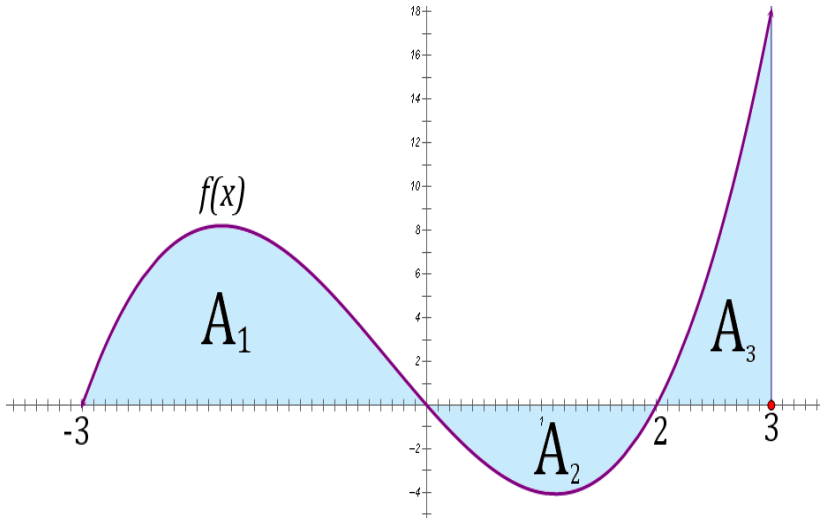
Question 16

Express $\int_{-3}^{3} f(x)dx$ in terms of the values of A_1, A_2, A_3



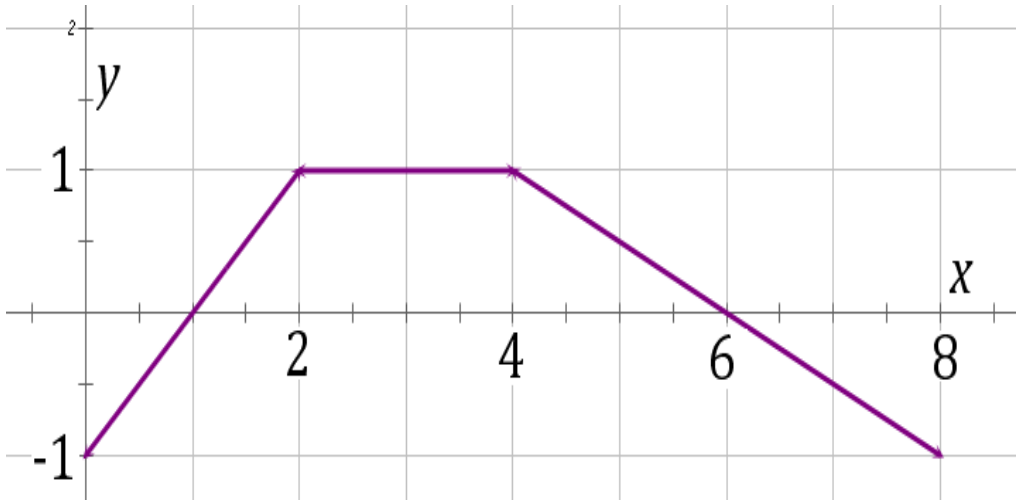
Question 17

Express A_1 as a definite integral



Question 18

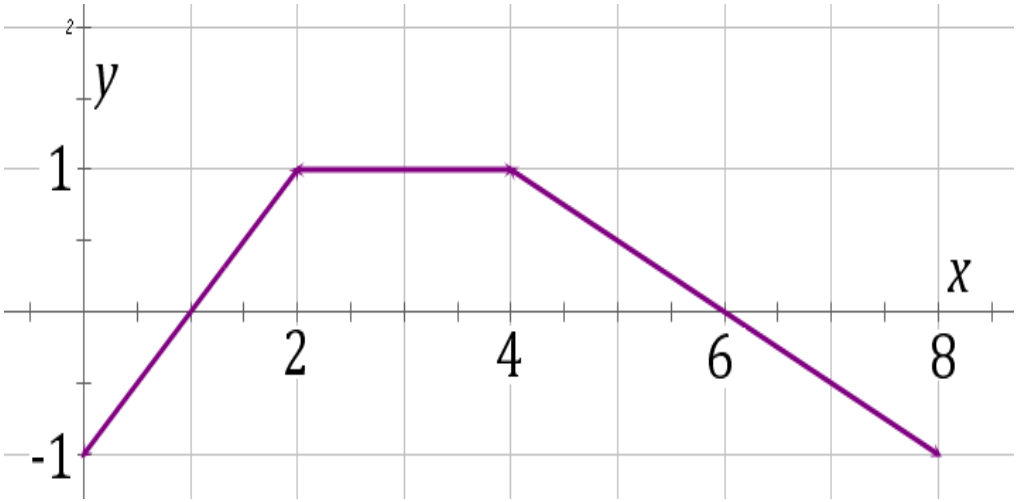
Let $f(x)$ be the function graphed below. What is $\int_0^2 f(x)dx$?



Question 19

Let $f(x)$ be the function graphed below. Order the following from least to greatest:

$$\int_0^1 f(x)dx. \int_0^3 f(x)dx, \int_2^4 f(x)dx, \int_7^8 f(x)dx$$



Question 20

A ball is thrown into the air with an initial velocity of 60 ft/sec from a height of 30 ft.

Find the height function $h(t)$ and the velocity function $v(t)$ for the motion of the ball. Assume $a(t) = -32$ ft/sec^2.

Question 21

Find the coordinates (x, y) of the local maximum of the function. Use calculus, not your graphing calculator.

$f(x) = 2x^3 - 3x^2 - 36x$

Question 22

If the derivative of a graph is decreasing at a point x=a, then the original function at that point must be:

a. negative
b. concave down
c. a local min
d. a local max
e. cannot be determined

Question 23

If the derivative of a graph is zero at a point x=a, then the original function at that point must be:

a. negative
b. concave down
c. a local min
d. a local max
e. cannot be determined