Question 1

Draw a careful sketch of $f(x) = -2x + 3$ from x= -3 to 3

Include dots on the graph for the x-intercept and y-intercept

Question 2

Is the signed area under the curve of $f(x) = -2x + 3$ between x= -3 to 3 positive or negative?

Question 3

Compute the signed area under the curve of

$$f(x) = -2x + 3$$

between x= -3 to 3 using geometry (show work).

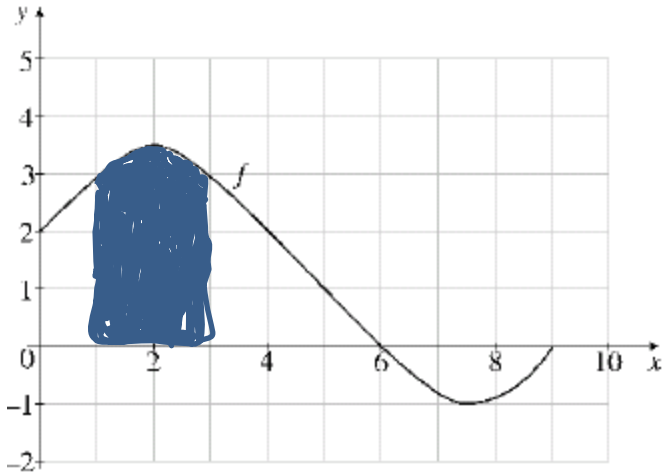
Question 4

Computer the signed area under the curve of

$$f(x) = -2x + 3$$

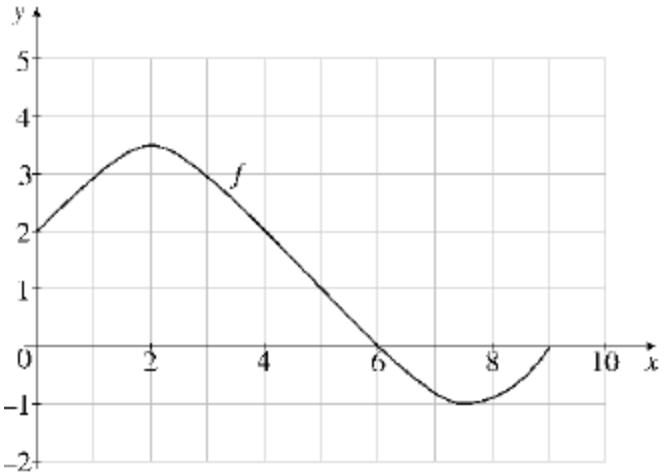
between x= -3 to 3 using calculus and proper integral notation.

Question 5



Express the shaded area as a definite integral

Question 6



Order from smallest to largest:

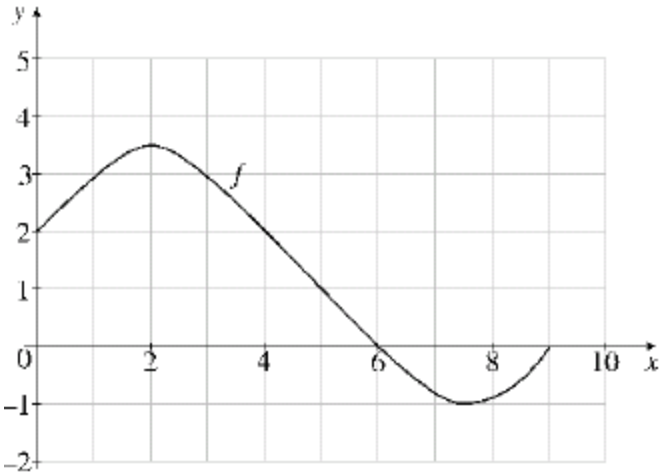
$$(a)\int_0^3 f(x)dx$$

$$(b)\int_4^7 f(x)dx$$

$$(c)\int_0^7 f(x)dx$$

$$(d)\int_6^8 f(x)dx$$

Question 7



Order from smallest to largest:

$(a)\ f'(0)$

$(b)\ f'(2)$

$(c)\ f'(4.5)$

$(d)\ f'(7)$

Question 8

What is the average rate of change from x = 2 to x = 5 for the function $f(x) = 2x^2 + 1$

Question 9

What is the instantaneous rate of the function

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

at the point x=3?

Question 10

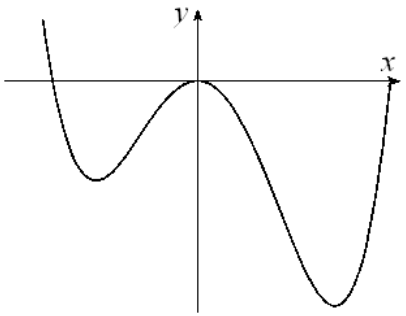
Use calculus (no calculator) to find all local max or mins of the function $f(x) = \frac{1}{3}x^3 - 4x$

Question 11

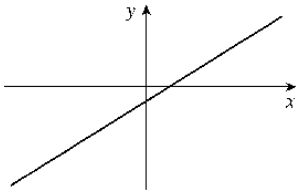
Find the points of inflection (if any) in the following function: $f(x) = \frac{1}{3}x^3 - 4x$

Question 12

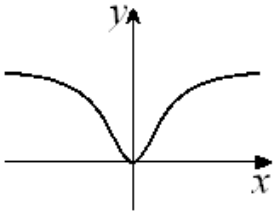
Given the graph of $y = f(x)$ below, circle the letter of the graph which best represents the graph of the derivative,



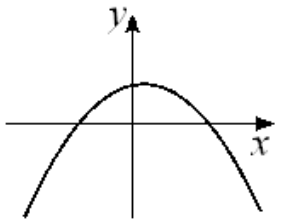
a.



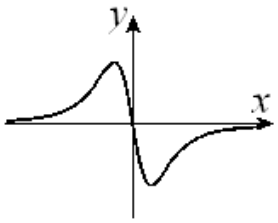
b.



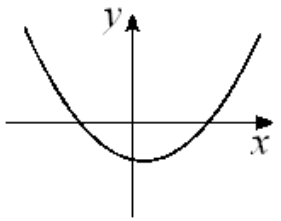
c.



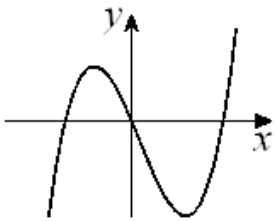
d.



e.



f.



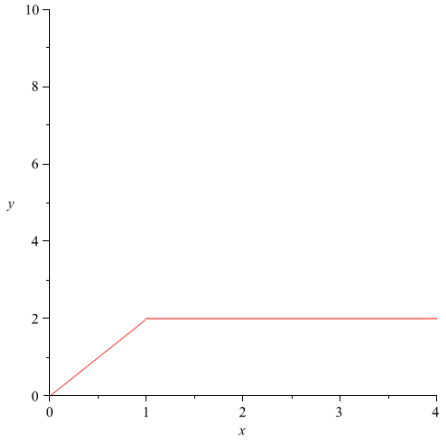
Question 13

"A is a function of B" is written as:

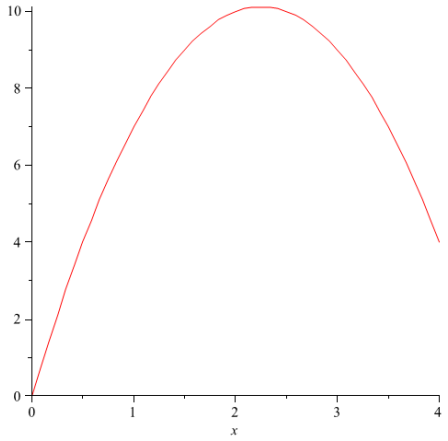
A. B = f(A)
B. A = f(B)

Question 14

The following are the graphs of the velocity in inches/second of two particles A and B at time t seconds



Particle A

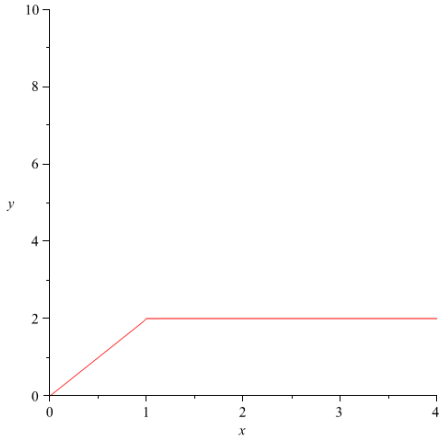


Particle B

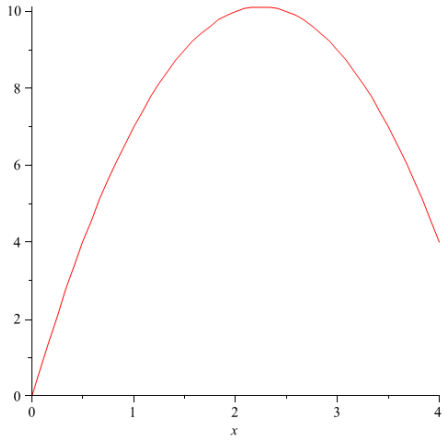
When is Particle A speeding up?

Question 15

The following are the graphs of the velocity in inches/second of two particles A and B at time t seconds



Particle A

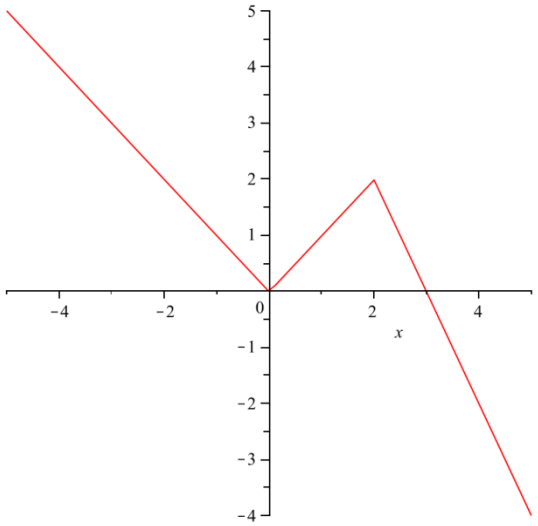


Particle B

Which particle has traveled the farthest after 4 seconds? Explain.

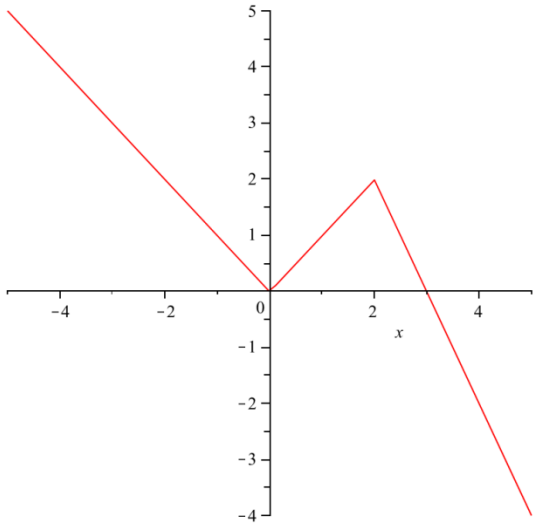
Question 16

Is the following function continuous? Explain



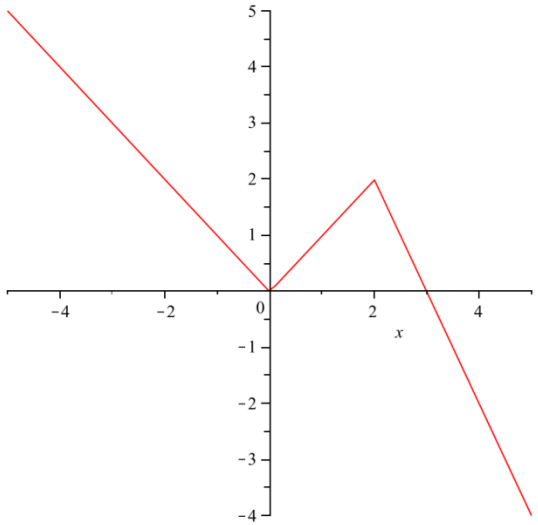
Question 17

Is the following function differentiable everywhere? Explain



Question 18

What is $\lim_{x \to 2^-} f'(x)$



Question 19

Evaluate the following:

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

Question 20

Evaluate the following:

$$\int 3\sin(x) - x^2 dx$$

Question 21

Evaluate the following:

$$\int_1^2 \left(3x^2 - \frac{1}{x^2} \right) dx$$

Question 22

Evaluate the following:

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

Question 23

Find the following derivative

$$f(x) = 3x^2 \cos(x)$$

Question 24

Find the following derivative

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

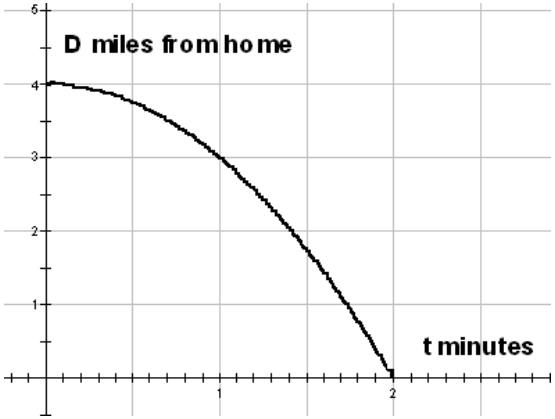
Question 25

Find the following derivative

$$f(x) = \sqrt{(x^3 - 2x + 5)}$$

Question 26

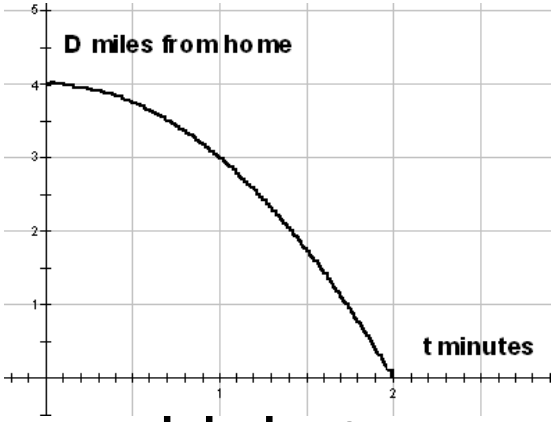
This graph shows two minutes of a trip starting at (0, 4) and ending at (2, 0).



What is Eugene's average speed in mph for the trip? Is he riding a bike or walking or…?

Question 27

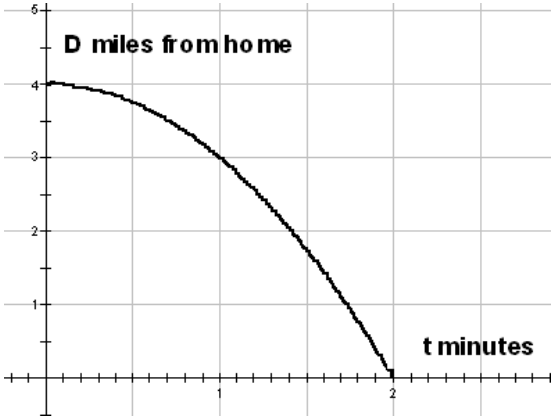
This graph shows two minutes of a trip starting at (0, 4) and ending at (2, 0).



Explain what you would do to compute Eugene's speed at t = 1 minute. What calculus concept is this?

Question 28

This graph shows two minutes of a trip starting at (0, 4) and ending at (2, 0).



Is Eugene going faster and faster, slower and slower or …?

Question 29

Sketch a graph that has the following properties:

- $f(0) = 0$
- $f'(x) > 0$ for $x \leq 0$
- $f(x)$ has a jump discontinuity at $x=2$
- $f(x)$ is not differentiable at $x=3$
- $f'(x) = 0$ at $x=4$

Question 30

Let f(x) denote a function and f’(x) the derivative of that function.

If f(x) is increasing then f’(x) is

a. Increasing	b. Positive	c. Decreasing	d. Negative
e. Concave up	f. Zero	g. Concave down	h. Cannot be determined

Question 31

Let f(x) denote a function and f’(x) the derivative of that function.

If f(x) is zero then f’(x) is

a. Increasing	b. Positive	c. Decreasing	d. Negative
e. Concave up	f. Zero	g. Concave down	h. Cannot be determined

Question 32

Let f(x) denote a function and f’(x) the derivative of that function.

If f(x) is concave up then f’(x) is

a. Increasing	b. Positive	c. Decreasing	d. Negative
e. Concave up	f. Zero	g. Concave down	h. Cannot be determined

Question 33

Let f(x) denote a function and f’(x) the derivative of that function.

If f’(x) is a local max then f(x) is

a. Increasing	b. Positive	c. Decreasing	d. Negative
e. Concave up	f. Zero	g. Concave down	h. Cannot be determined

Question 34

Let f(x) denote a function and f’(x) the derivative of that function.

If f’(x) is negative then f(x) is

a. Increasing	b. Positive	c. Decreasing	d. Negative
e. Concave up	f. Zero	g. Concave down	h. Cannot be determined

Question 35

What is the domain and range of the following function?

$$f(x) = \frac{4}{\sqrt{x^2 - 1}}$$