Chapter 5

Test Review

Evaluate the integral. (p. 282 #7)

$$\int_{-2}^{1} 5\,dx =$$

Evaluate the integral. (p. 316 #26)

$$\int_1^2 \left(x + \frac{1}{x^2} \right) dx =$$

Evaluate the integral. (p. 316 #27)

$$\int_{\frac{-\pi}{3}}^{0} \left(\sec x \tan x\right) dx =$$

Use properties of integrals to answer the following (p. 290 #1)

$$\int_1^2 f(x)\,dx = -4 \quad \int_1^5 f(x)\,dx = 6 \quad \int_1^5 g(x)\,dx = 8$$

$$a)\ \int_2^2 g(x)\,dx = \qquad\qquad b.\ \int_5^1 g(x)\,dx =$$

$$\text{e. } \int_1^5 \left[f(x) - g(x)\right] dx =$$

Use properties of integrals to answer the following (p. 290 #1)

$$\int_1^2 f(x)\,dx = -4 \quad \int_1^5 f(x)\,dx = 6 \quad \int_1^5 g(x)\,dx = 8$$

d. $\int_2^5 f(x)\,dx =$

Use properties of integrals to answer the following (p. 286 Ex. 1)

$$\int_{-1}^{1} f(x)\,dx = 5 \quad \int_{1}^{4} f(x)\,dx = -2 \quad \int_{-1}^{1} h(x)\,dx = 7$$

$a)\ \int_{4}^{1} f(x)\,dx =$

$b.\ \int_{-1}^{4} f(x)\,dx =$

$$\text{e. } \int_{-1}^{1} \left[2f(x) + 3h(x)\right] dx =$$

Find the average value of the function using antiderivatives p. 291 32

$$y = \frac{1}{x} \qquad [e, 2e]$$

Find dy/dx

p. 302 15

$$y = \int_{x^3}^{5} \frac{\cos t}{t^2 + 2} dt$$

Find dy/dx

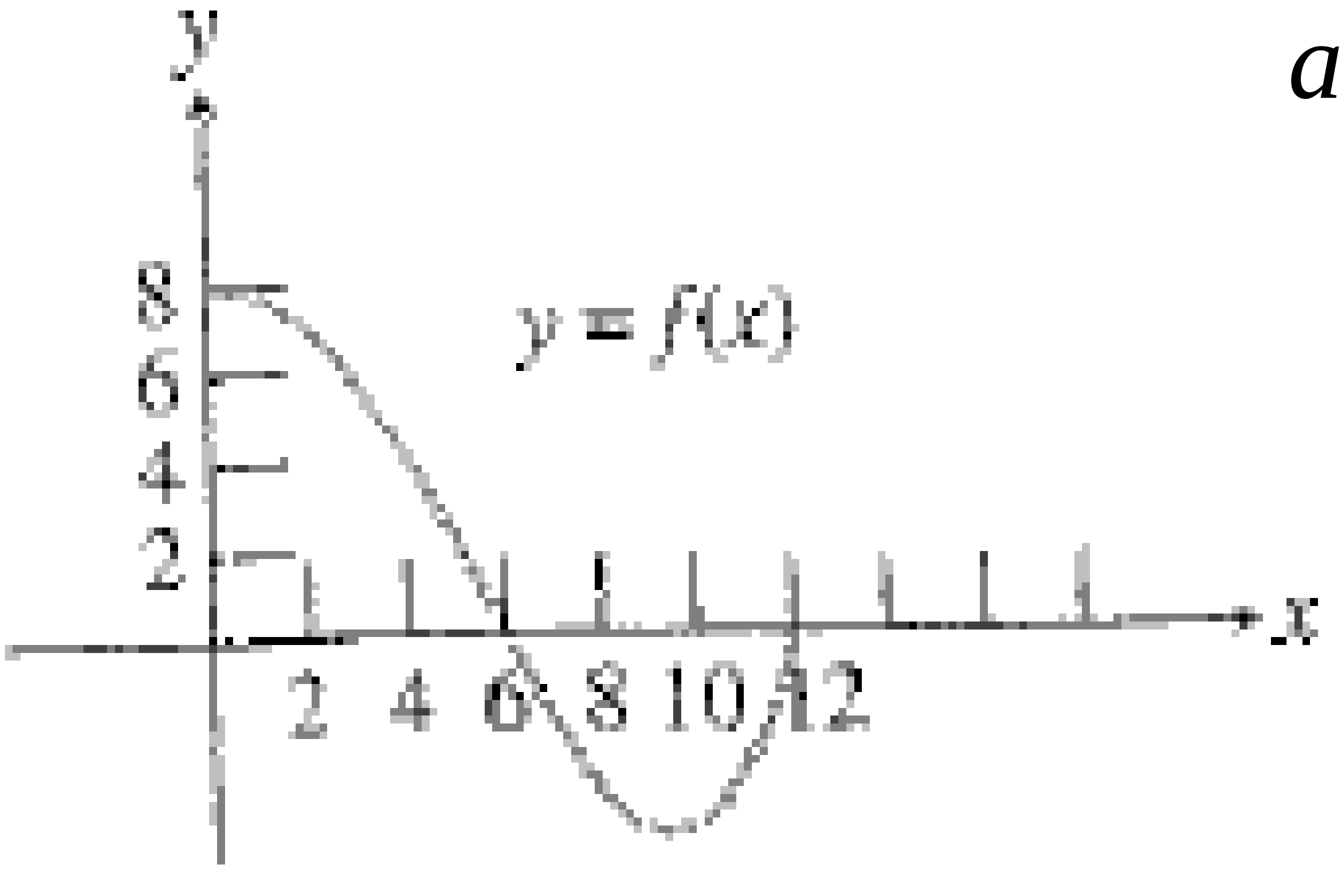
p. 302 20

$$y = \int_{\sin x}^{\cos x} t^2 dt$$

Find the average value of $\sqrt{\cos x}$ on the interval [-1,1] p. 303 52

$H(x) = \int_0^x f(t)dt$, where f is the continuous function $p.303\ 57$

with domain $[0,12]$ graphed here.

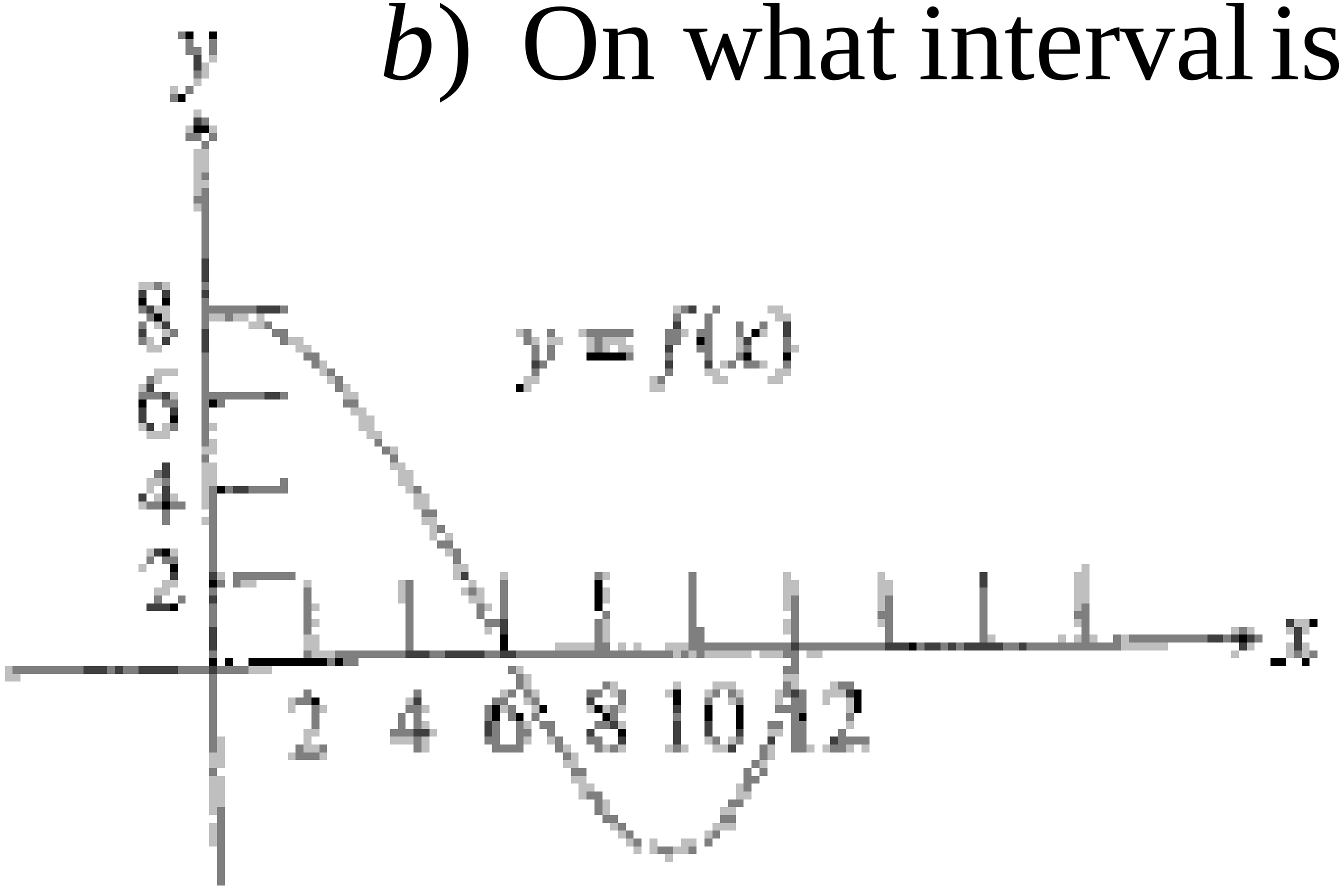


$a)$ Find H(0).

$H(x) = \int_0^x f(t)dt$, where f is the continuous function $p.303\ 57$

with domain $[0,12]$ graphed here.

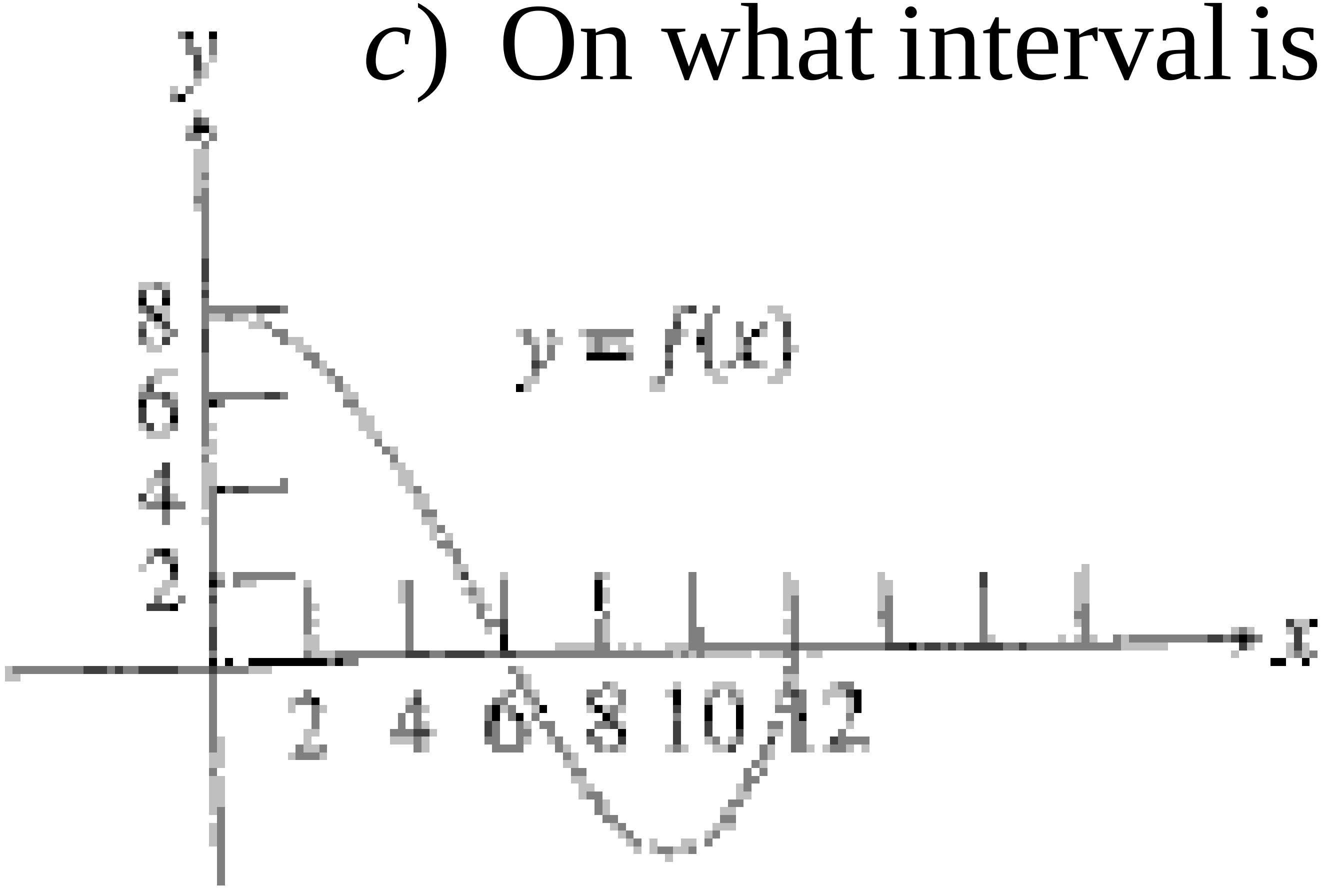
$b)$ On what interval is H increasing. Explain



$H(x) = \int_0^x f(t)dt$, where f is the continuous function $p.303\ 57$

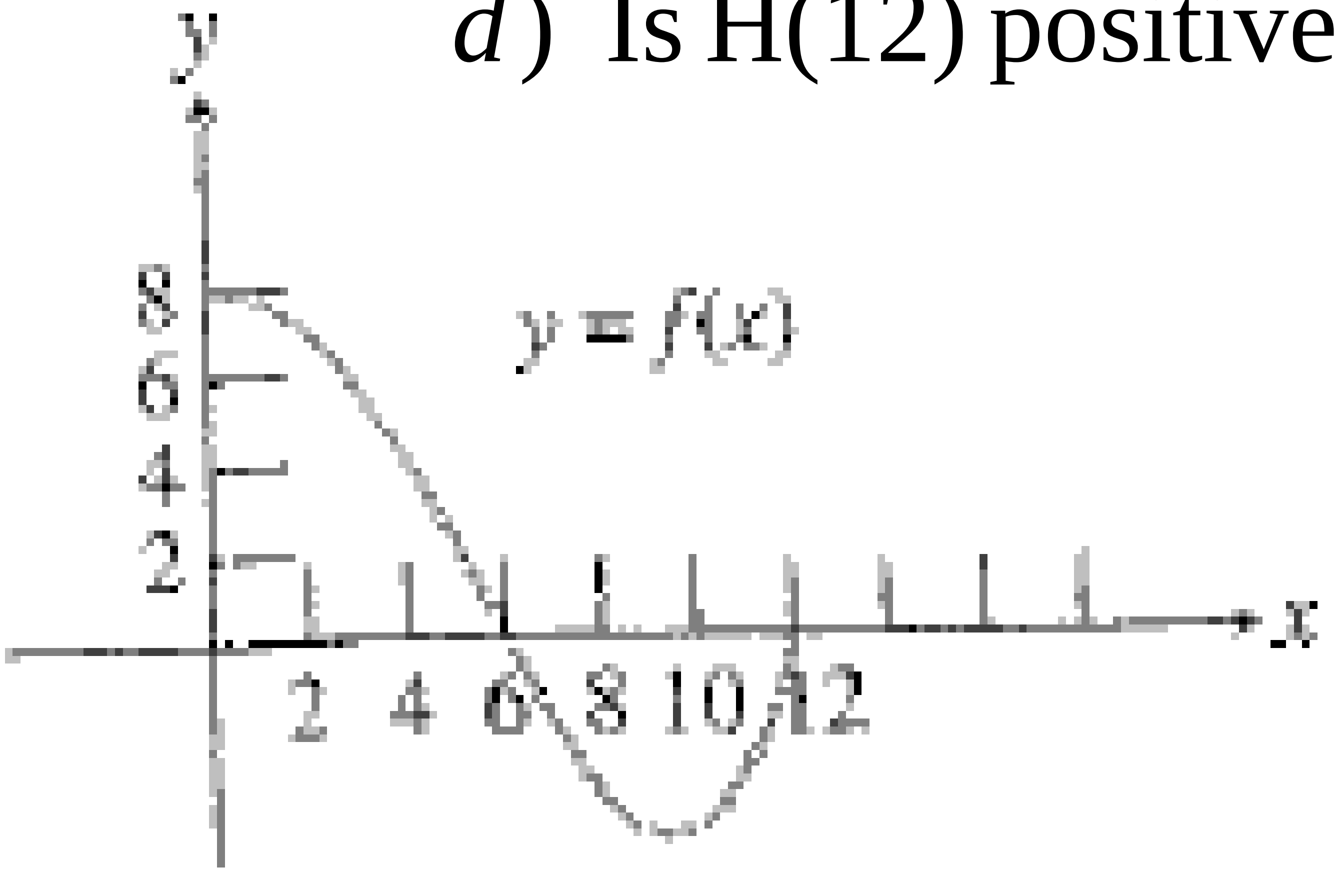
with domain $[0,12]$ graphed here.

$c)$ On what interval is H concave up. Explain



$H(x)=\int_0^x f(t)dt$, where f is the continuous function

with domain $[0,12]$ graphed here.

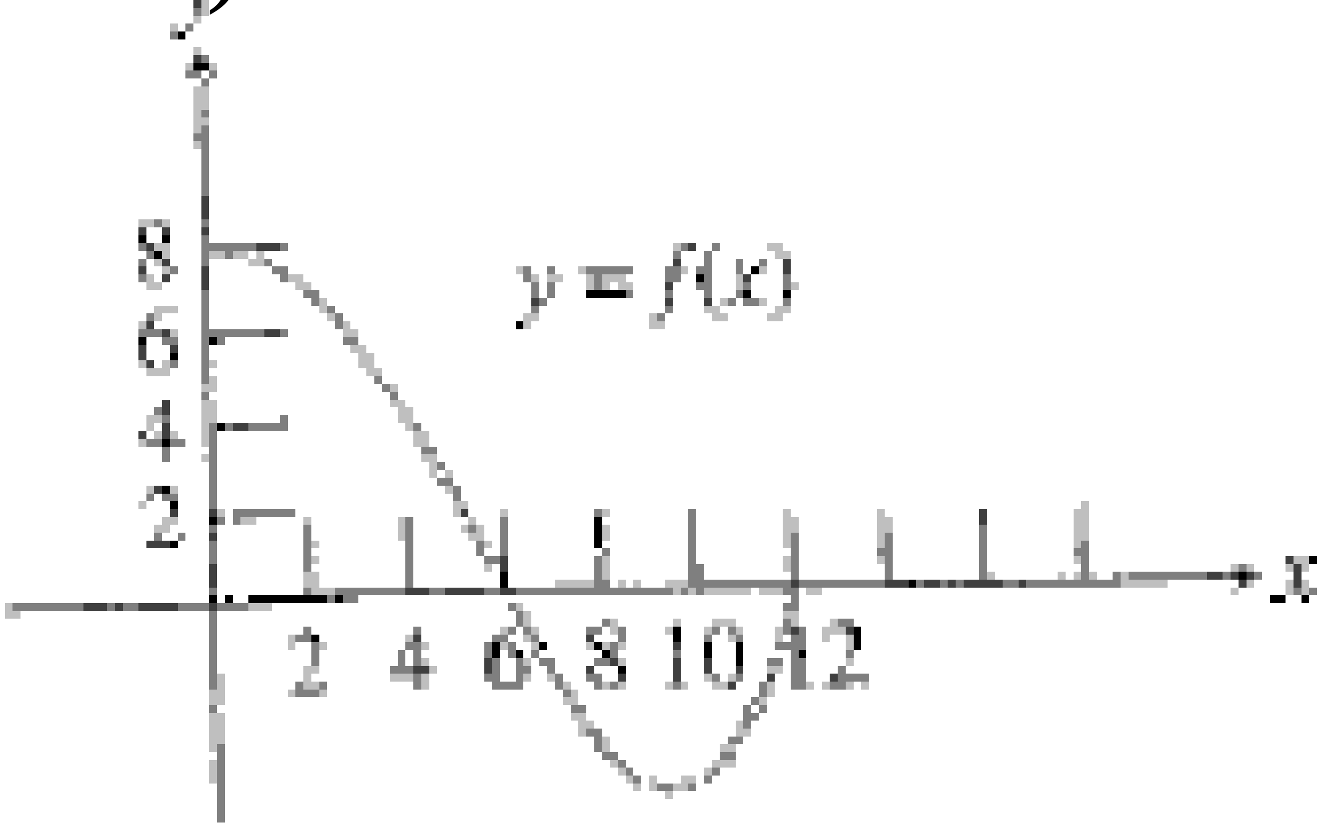


$d)$ Is H(12) positive or negative. Explain

$H(x)=\int_0^x f(t)dt$, where f is the continuous function $p.303\;57$

with domain [0,12] graphed here.

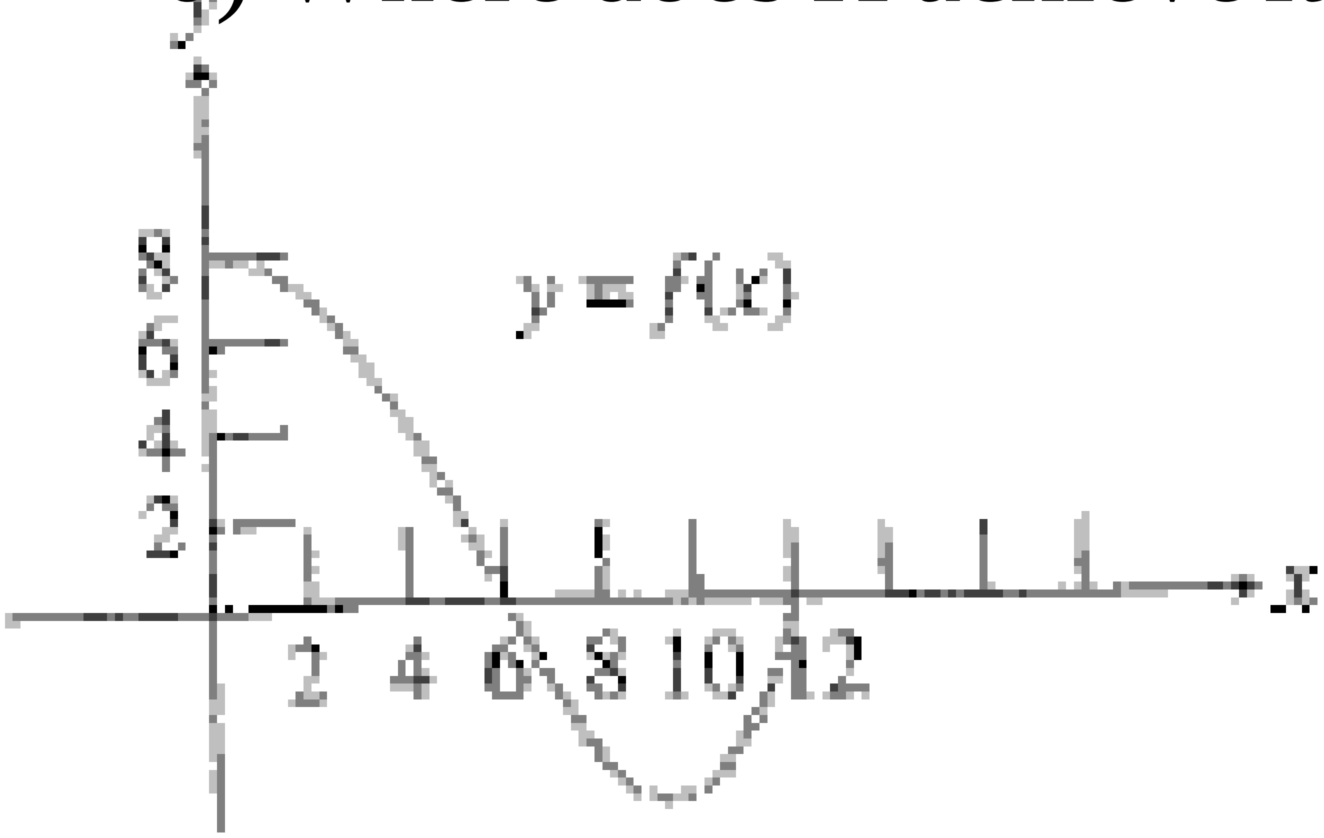
e) Where does H achieve its maximum value. Explain



$H(x)=\int_0^x f(t)dt$, where f is the continuous function $p.303\ 57$

with domain $[0,12]$ graphed here.

e) Where does H achieve its minimum value. Explain

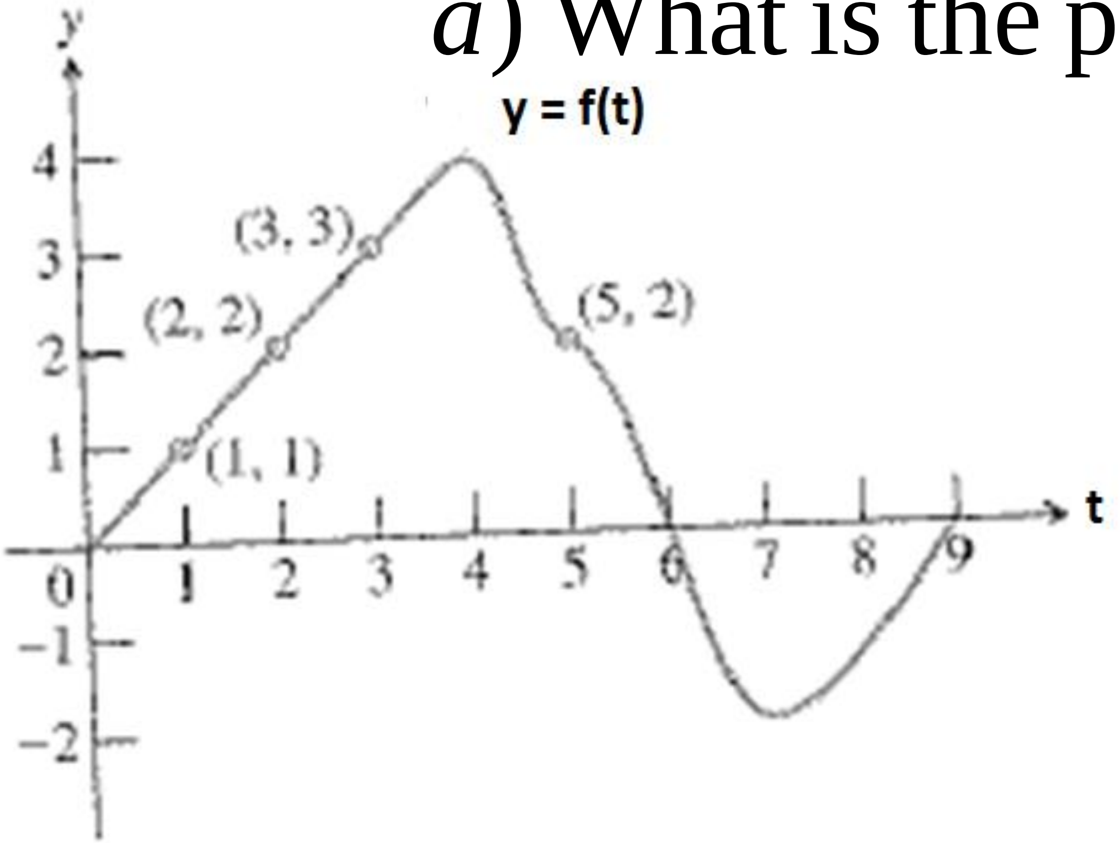


f is the differentiable function whose graph is shown.

The position at time t(sec) of a particle moving

along a coordinate axis is $s = \int_0^t f(x)dx$

a) What is the particles velocity at time $t = 5$?



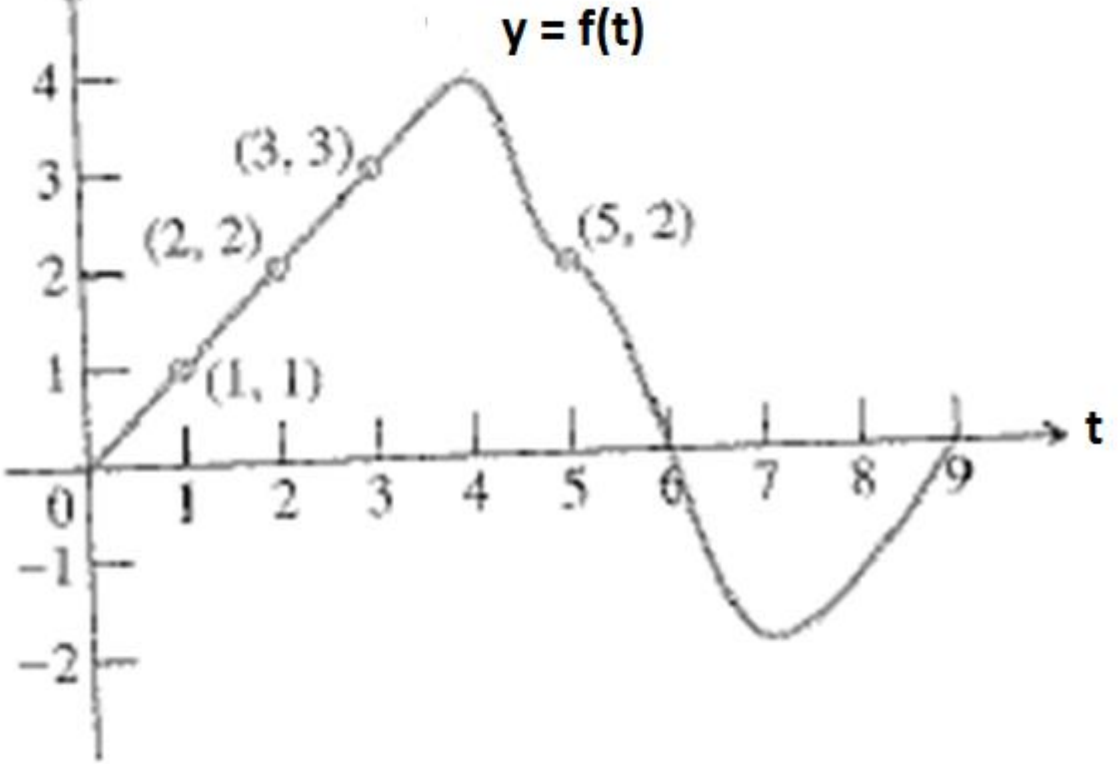
f is the differentiable function whose graph is shown.

p.304 58

The position at time t(sec) of a particle moving

along a coordinate axis is $s = \int_0^t f(x)dx$

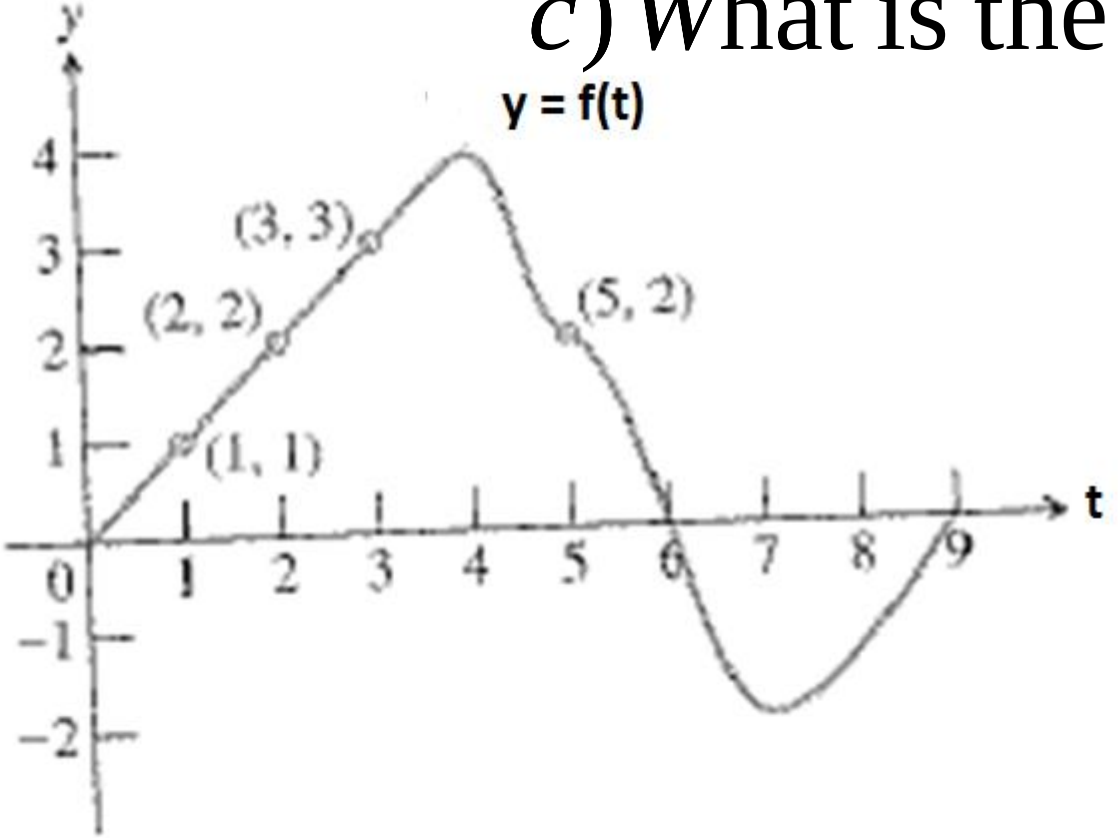
$b)$ *I*s the acceleration at time t = 5 positive or negative?



f is the differentiable function whose graph is shown.

The position at time t(sec) of a particle moving along a coordinate axis is $s = \int_0^t f(x)dx$

$c)$ What is the particles position at time $t = 3$?

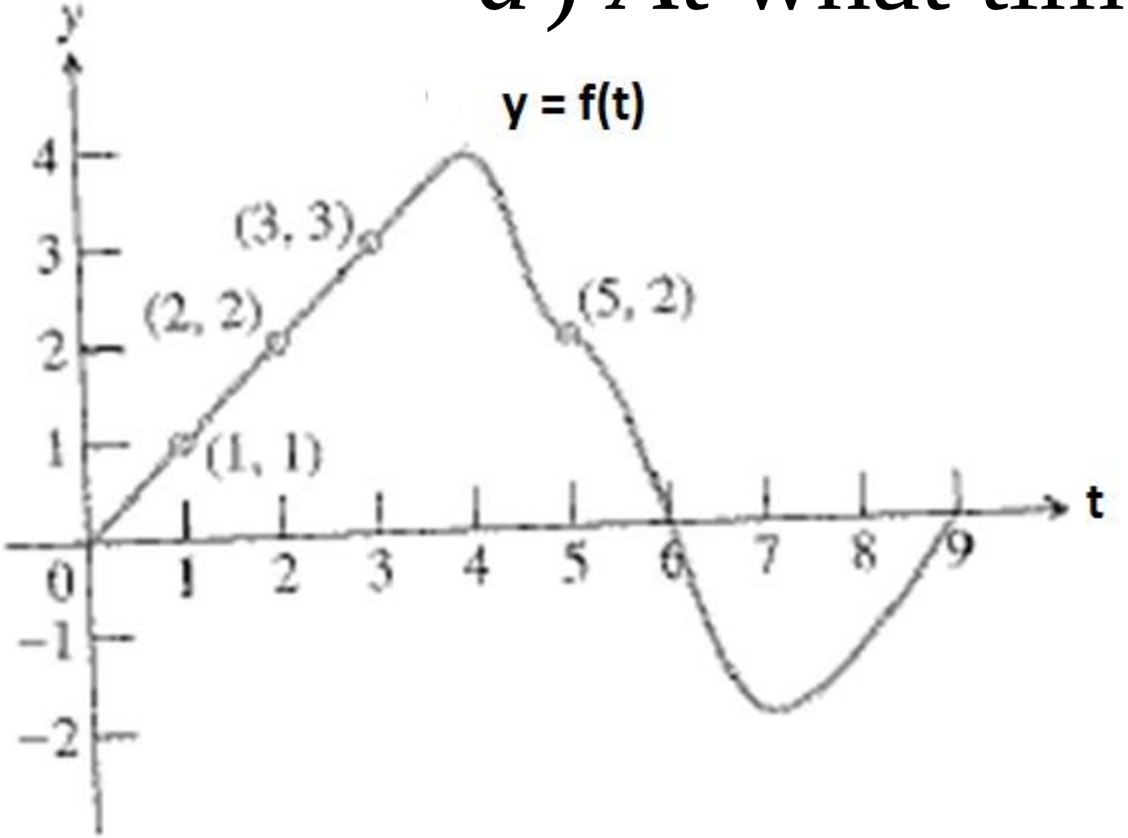


f is the differentiable function whose graph is shown.

$p.304\ 58$

The position at time t(sec) of a particle moving along a coordinate axis is $s = \int_0^t f(x)dx$

$d)$ At what time during the first 9 seconds does s have its largest value?

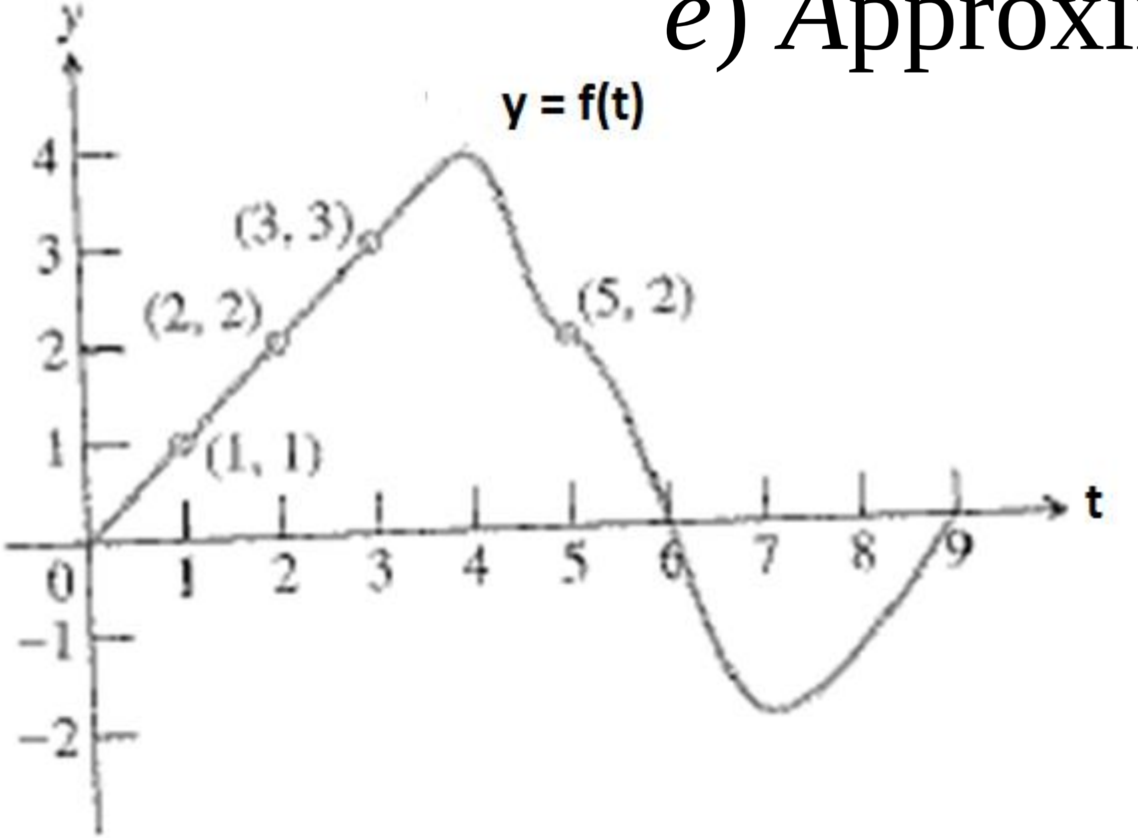


f is the differentiable function whose graph is shown. $p.304\ 58$

The position at time t(sec) of a particle moving

along a coordinate axis is $s = \int_0^t f(x)dx$

$e)$ Approximately when is acceleration 0?



f is the differentiable function whose graph is shown.

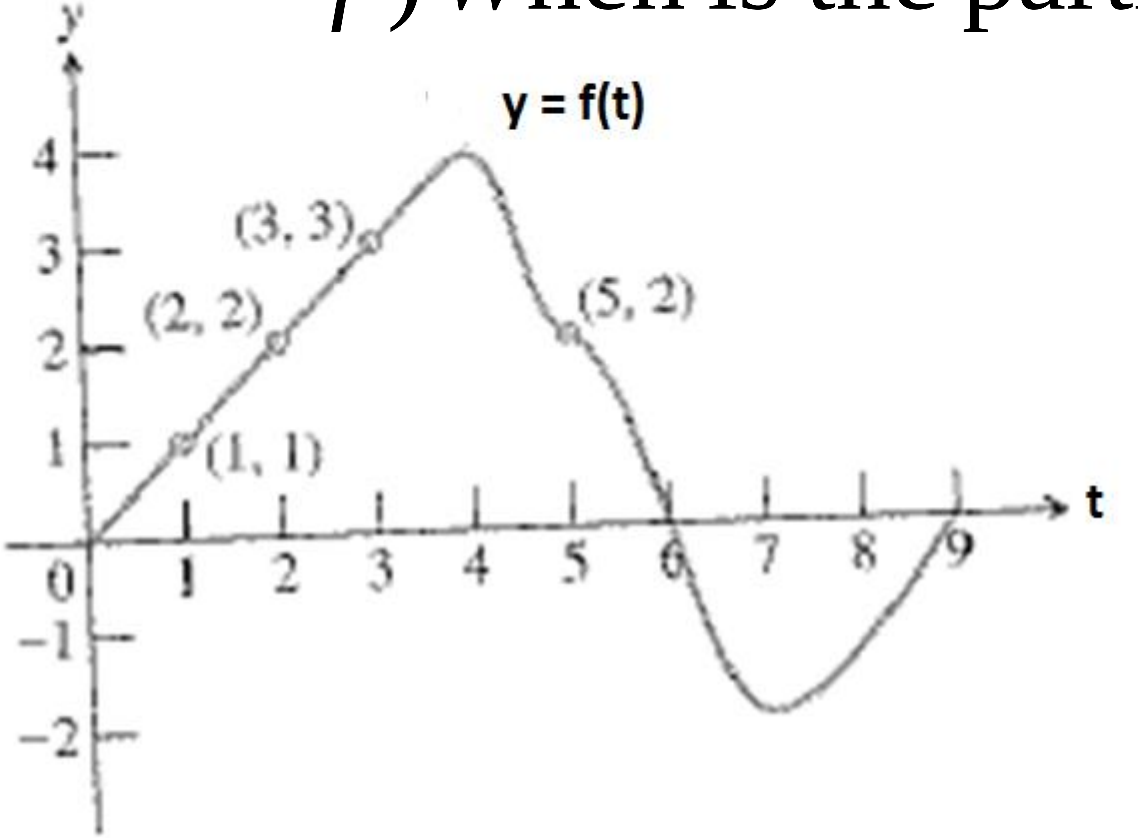
p.304 58

The position at time t(sec) of a particle moving

along a coordinate axis is $s = \int_0^t f(x)dx$

f) When is the particle moving toward the origin?

Away from the origin?

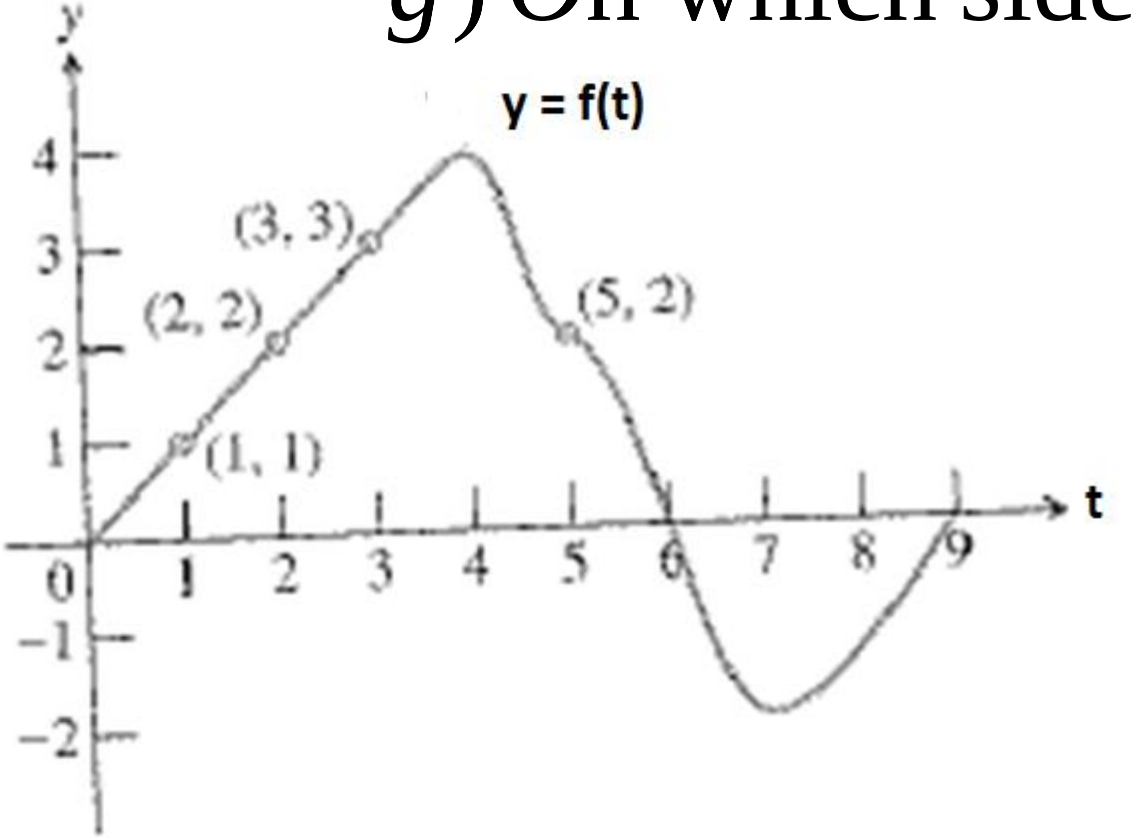


f is the differentiable function whose graph is shown. $p.304\ 58$

The position at time t(sec) of a particle moving

along a coordinate axis is $s = \int_0^t f(x)dx$

$g)$ On which side of the origin does the particle lie at time $\mathrm{t} = 9$?



Evaluate the integral. (p. 291 #19)

$$\int_{\pi}^{2\pi} \sin x \, dx =$$

Evaluate the integral. (p. 291 #20)

$$\int_0^{\pi/2} \cos x \, dx =$$

Evaluate the integral. (p. 291 #21)

$$\int_0^1 e^x \, dx =$$

Evaluate the integral. (p. 291 #30)

$$\int_1^4 - x^2 \, dx =$$

Use the data below to approximate the area under the curve using the Trapezoid Rule with 4 sub-intervals.

t	0	2	5	9	10
H(t)	66	60	52	44	43

Use the data below to approximate the area under the curve using a Right Riemann Sum with 4 sub-intervals.

t	0	2	5	9	10
H(t)	66	60	52	44	43

Use the data below to approximate the area under the curve using a Left Riemann Sum with 4 sub-intervals.

t	0	2	5	9	10
H(t)	66	60	52	44	43

- Hot water is dripping through a coffeemaker, filling a large cup with coffee. The amount of coffee in the cup at time t, from [0, 6], is given by a differentiable function C, where t is measured in minutes. Selected values of C(t), measured in ounces, are given in the table.

t(minutes)	0	1	2	3	4	5	6
C(t) ounces	0	5.3	8.8	11.2	12.8	13.8	14.5

t(minutes)	0	1	2	3	4	5	6
C(t) ounces	**0**	**5.3**	**8.8**	**11.2**	**12.8**	**13.8**	**14.5**

- Use a midpoint sum with three subinterval of equal length indicated by the data in the table to approximate the value of $\frac{1}{6}\int_0^6 C(t)dt.$

t(minutes)	0	1	2	3	4	5	6
C(t) ounces	**0**	**5.3**	**8.8**	**11.2**	**12.8**	**13.8**	**14.5**

- Using correct units, explain the meaning of $\frac{1}{6}\int_0^6 C(t)dt$ in the context of the problem.