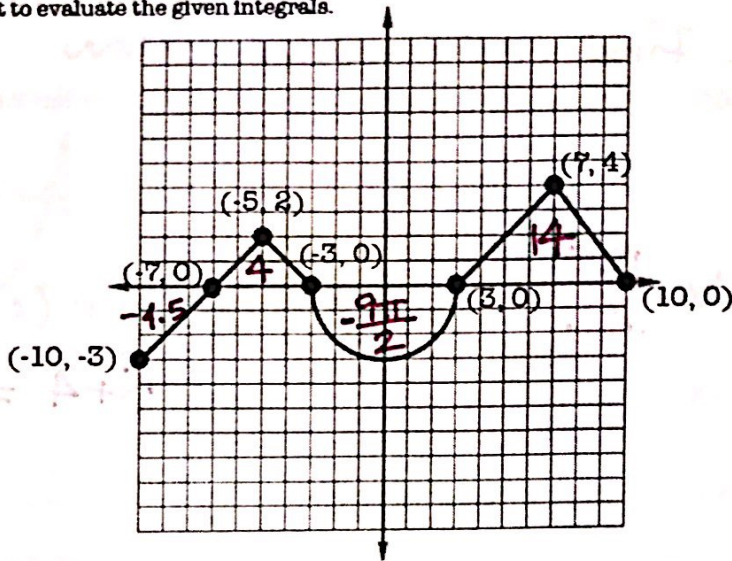


The graph that is given is made of straight lines and a semicircle. Use it to evaluate the given integrals.



1) $\int_{-7}^{-3} f(x) dx = 4$	2) $\int_{-10}^{-7} f(x) dx = -4.5$	3) $\int_3^{10} f(x) dx = 14$
4) $\int_{-10}^{-3} f(x) dx = -14$	5) $\int_{-3}^3 f(x) dx = -\frac{9\pi}{2}$	6) $\int_{-10}^{10} f(x) dx = \frac{27}{2} - \frac{9\pi}{2}$
7) $\int_{-3}^{-10} f(x) dx = \frac{1}{2}$	8) $\int_{-10}^{-3} f(x) + 2 dx = \frac{-\frac{1}{2} + 14}{2} = \frac{27}{2}$ <small><math>-\int_{-10}^{-3} f(x) dx + \int_{-10}^{-3} 2 dx</math></small>	9) $2 \int_3^{10}  f(x)  dx = 28$
10) $\left  \int_{-10}^{-3} f(x) dx \right  = \frac{1}{2}$	11) $\int_0^7 f(x) dx = \frac{-9\pi}{4} + 8$	12) $-\int_{-7}^7 f(x) dx = -(4 - \frac{9\pi}{2} + 8) - (12 - \frac{9\pi}{2})$ $= -12 + \frac{9\pi}{2}$

13) Given  $g(x) = \int_{-10}^x f(x) dx$ , find...

a)  $g_0(0) = \boxed{-\frac{1}{2} - \frac{9\pi}{4}}$     b)  $g_4(7) = \boxed{\frac{15}{2} - \frac{9\pi}{2}}$     c)  $g'(-5) = \boxed{2}$     d)  $g''(-4) = \boxed{-1}$

$\int_{-10}^0 f(x) dx = -4.5 + 4 - \frac{9\pi}{4}$      $\int_{-4}^7 f(x) dx = -4.5 + 4 - \frac{9\pi}{2} + 8$

14) Where is  $g(x)$  increasing and decreasing?

inc:  $(-5, -3) \cup (3, 10)$     dec:  $(-10, -7) \cup (-3, 3)$

15) Where is  $g(x)$  concave up and concave down?

CU:  $(-7, -5) \cup (0, 3) \cup (3, 7)$     CD:  $(-5, -3) \cup (-3, 0) \cup (7, 10)$

16) What is the absolute maximum value of  $g(x)$  on  $[-10, 10]$ ?  $-\frac{1}{2}$

17) What is the absolute minimum value of  $g(x)$  on  $[-10, 10]$ ?  $\boxed{-\frac{1}{2} - \frac{9\pi}{4}}$

18) Suppose that  $f$  and  $h$  are continuous functions and that  $\int_1^9 f(x) dx = -1$ ,  $\int_7^9 f(x) dx = 5$ , and  $\int_7^9 h(x) dx = 4$ . Find each value below.

a)  $\int_1^9 -2f(x) dx$  2

b)  $\int_7^9 [f(x) + h(x)] dx$   
 $5 + 4 =$  9

c)  $\int_7^9 [2f(x) - 3h(x)] dx$   
 $2(5) - 3(4)$   
 $10 - 12 =$  -2

d)  $\int_1^7 f(x) dx$   
 $-1 - 5 =$  -6

e)  $\int_9^1 [f(x) + 3] dx$   
 $= \int_9^1 f(x) dx + \int_9^1 3 dx$   
 $1 + (-8)(3)$   
 $1 - 24 =$  -23

f)  $\int_9^7 4h(x) dx$   
 $= 4(-4) =$  -16