4.5 Some Riemann Sums

920. The table shows the velocity of a model train engine moving along a track for 10 seconds. Estimate the distance traveled by the engine using 10 subintervals of length 1 with a) left-hand values and b) right-hand values.

Time (seconds)	0	1	2	3	4	5	6	7	8	9	10
Velocity (in/sec)	0	12	22	10	5	13	11	6	2	6	0

921. The table shows the velocity of a vintage sports car accelerating from 0 to 142 miles per hour in 36 seconds (0.01 hours).

hours	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	0.010
mph	0	40	62	82	96	108	116	125	132	137	142

a) Use a Riemann sum to estimate how far the car traveled during the 36 seconds it took to reach 142 mph.

b) Roughly how many seconds did it take the car to reach the halfway point? About how fast was the car going then?

922. Oil is leaking out of a tanker damaged at sea. The damage to the tanker is worsening as evidenced by the increased leakage each hour, recorded in the following table.

Time (hours)	0	1	2	3	4	5	6	7	8
Leakage (gal./hour)	50	70	97	136	190	265	369	516	720

a) Give an upper and lower estimate of the total quantity of oil that has escaped after 5 hours.

b) Give an upper and lower estimate of the total quantity of oil that has escaped after 8 hours.

c) The tanker continues to leak 720 gal/hr after the first 8 hours. If the tanker originally contained 25,000 gallons of oil, approximately how many more hours will elapse in the worst case before all the oil has spilled? In the best case?

923. A rectangular swimming pool is 30 ft wide and 50 ft long. The table below shows the depth of the water at 5 ft intervals from one end of the pool to the other. Estimate the volume of water in the pool by computing the average of the left-hand and right-hand Riemann sums.

Position (ft)	0	5	10	15	20	25	30	35	40	45	50
Depth (ft)	6.0	8.2	9.1	9.9	10.5	11.0	11.5	11.9	12.3	12.7	13.0

Don't confuse being busy with accomplishment. —*Anonymous*