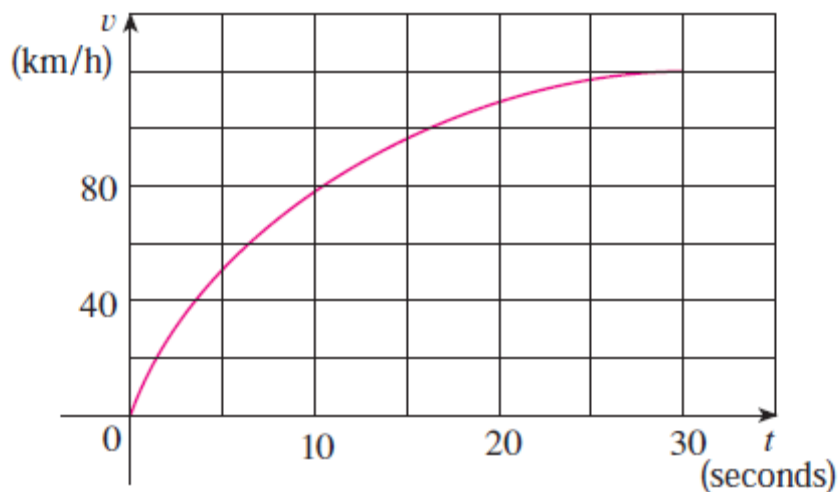


Math 131 Week in Review
Sections 4.8, 5.1, 5.2
4/11/10

1. Find the most general antiderivative of $f(x) = 72x^{-1.1}$.
2. Find the most general antiderivative of $g(r) = (4r + 9)^2$.
3. Find the most general antiderivative of $h(t) = \sec t \tan t$.
4. Find the most general antiderivative of $f(x) = 3e^x + 5\sqrt[3]{x^2} - \sqrt[5]{x^3}$.
5. Find the most general antiderivative of $g(x) = \frac{3x^5 - 2x^3 + 5x}{x^4}$.
6. Find f given $f'(t) = 1 + \sin t$ and $f(0) = 2$.
7. Find g given $g''(x) = 6 - e^{-x}$, $g(0) = -6$, and $g(-1) = -e - 2$.

8. The velocity graph of a car accelerating from rest to a speed of 120 km/h over a period of 30 seconds is shown. Estimate the distance traveled during this period.
(p. 342 #16)



9. Jim walked along the bank of a tidal river watching the incoming tide carry a bottle upstream, recording the velocity of the flow every 5 minutes for 30 minutes. The results are shown in the table below.

Adapted from Finney, Demana, Waits, & Kennedy, *Calculus: Graphical, Numerical, Algebraic*, 2007.

Time (min)	Velocity (m/sec)
0	1
5	1.2
10	1.7
15	2.0
20	1.8
25	1.6
30	1.4

About how far upstream does the bottle travel during the half-hour? Find L_6 and R_6 .

10. Express the limit as a definite integral on the interval $[-3, 4]$.

$$\lim_{n \rightarrow \infty} \sum_{i=1}^n \frac{\sin x_i}{x_i} \Delta x$$

11. Use the form of the definition of the integral given below to evaluate the integral

$$\int_{-2}^1 (1 - 2x) dx$$

Definition: If f is integrable on $[a, b]$, then $\int_a^b f(x) dx = \lim_{n \rightarrow \infty} \sum_{i=1}^n f(x_i) \Delta x$ where $\Delta x = \frac{b-a}{n}$ and $x_i = a + i \Delta x$.

12. Evaluate the integral by interpreting it in terms of areas: $\int_{-2}^1 |4 - x| dx$.

13. Use the properties of integrals to evaluate $\int_{-2}^1 (4x - 3x^2) dx$.

14. Given that $\int_{-2}^{11} f(x) dx = 32$ and $\int_{-2}^0 f(x) dx = 17$, find $\int_0^{11} f(x) dx$.