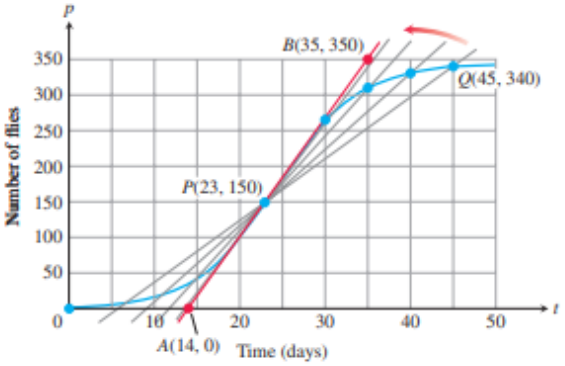
$$\begin{aligned}
\int_0^8 |v(t)|dt &= \int_0^5 |v(t)|dt + \int_5^8 |v(t)|dt \\
&= \int_0^5 (160 - 32t)\,dt - \int_5^8 (160 - 32t)\,dt \\
&= \left[160t - 16t^2\right]_0^5 - \left[160t - 16t^2\right]_5^8 \\
&= [(160)(5) - (16)(25)] - [(160)(8) - (16)(64) - ((160)(5) - (16)(25))] \\
&= 400 - (-144) = 544.
\end{aligned}$$

Q	Slope of $PQ = \Delta p/\Delta t$ (flies / day)
(45, 340)	$\frac{340 - 150}{45 - 23} \approx 8.6$
(40, 330)	$\frac{330 - 150}{40 - 23} \approx 10.6$
(35, 310)	$\frac{310 - 150}{35 - 23} \approx 13.3$
(30, 265)	$\frac{265 - 150}{30 - 23} \approx 16.4$



Exercises 5.5

Evaluating Indefinite Integrals

Evaluate the indefinite integrals in Exercises 1–16 by using the given substitutions to reduce the integrals to standard form.

1. $\int 2(2x + 4)^5\,dx, \quad u = 2x + 4$

2. $\int 7\sqrt{7x - 1}\,dx, \quad u = 7x - 1$

3. $\int 2x(x^2 + 5)^{-4}\,dx, \quad u = x^2 + 5$

4. $\int \frac{4x^3}{(x^4 + 1)^2}\,dx, \quad u = x^4 + 1$

5. $\int (3x + 2)(3x^2 + 4x)^4\,dx, \quad u = 3x^2 + 4x$

6. $\int \frac{(1 + \sqrt{x})^{1/3}}{\sqrt{x}}\,dx, \quad u = 1 + \sqrt{x}$

7. $\int \sin 3x\,dx, \quad u = 3x$

8. $\int x \sin(2x^2)\,dx, \quad u = 2x^2$

9. $\int \sec 2t \tan 2t\,dt, \quad u = 2t$

10. $\int \left(1 - \cos\frac{t}{2}\right)^2 \sin\frac{t}{2}\,dt, \quad u = 1 - \cos\frac{t}{2}$

11. $\int \frac{9r^2\,dr}{\sqrt{1 - r^3}}, \quad u = 1 - r^3$

12. $\int 12(y^4 + 4y^2 + 1)^2(y^3 + 2y)\,dy, \quad u = y^4 + 4y^2 + 1$

13. $\int \sqrt{x}\sin^2(x^{3/2} - 1)\,dx, \quad u = x^{3/2} - 1$

14. $\int \frac{1}{x^2}\cos^2\left(\frac{1}{x}\right)dx, \quad u = -\frac{1}{x}$

15. $\int \csc^2 2\theta \cot 2\theta\,d\theta$

    a. Using $u = \cot 2\theta$ **b.** Using $u = \csc 2\theta$

16. $\int \frac{dx}{\sqrt{5x + 8}}$

    a. Using $u = 5x + 8$ **b.** Using $u = \sqrt{5x + 8}$

Evaluate the integrals in Exercises 17–66.

17. $\int \sqrt{3 - 2s}\,ds$

18. $\int \frac{1}{\sqrt{5s + 4}}\,ds$

19. $\int \theta\sqrt[4]{1 - \theta^2}\,d\theta$

20. $\int 3y\sqrt{7 - 3y^2}\,dy$

21. $\int \frac{1}{\sqrt{x}(1 + \sqrt{x})^2}\,dx$

22. $\int \sqrt{\sin x}\cos^3 x\,dx$