AD 2. - Antiderivatives - Math 181

Find the antiderivatives of the following functions.

1. $f(x) = 78 \sin(4x)$
2. $f(x) = 47x^{-1}$
3. $f(x) = 86 \cos(9x)$
4. $f(x) = 96 \sin(4x)$
5. $f(x) = 34x^4$
6. $f(x) = 72x^4$
7. $f(x) = 2/3\,x^{-1}$
8. $f(x) = 27x^7$
9. $f(x) = 60x^5$
10. $f(x) = 75 \sin(3x)$

AD2, Antiderivatives Key

The functions and their antiderivatives.

1. $f(x) = 78 \sin(4x)$

$$F(x) = \int f(x)\,dx = \int 78 \sin(4x)\,dx = -\frac{39}{2}\cos(4x) + C$$

2. $f(x) = 47\,x^{-1}$

$$F(x) = \int f(x)\,dx = \int 47\,x^{-1}\,dx = 47 \ln(x) + C$$

3. $f(x) = 86 \cos(9x)$

$$F(x) = \int f(x)\,dx = \int 86 \cos(9x)\,dx = \frac{86}{9}\sin(9x) + C$$

4. $f(x) = 96 \sin(4x)$

$$F(x) = \int f(x)\,dx = \int 96 \sin(4x)\,dx = -24 \cos(4x) + C$$

5. $f(x) = 34\,x^4$

$$F(x) = \int f(x)\,dx = \int 34\,x^4\,dx = \frac{34}{5}\,x^5 + C$$

6. $f(x) = 72\,x^4$

$$F(x) = \int f(x)\,dx = \int 72\,x^4\,dx = \frac{72}{5}\,x^5 + C$$

7. $f(x) = 2/3\,x^{-1}$

$$F(x) = \int f(x)\,dx = \int 2/3\,x^{-1}\,dx = 2/3 \ln(x) + C$$

8. $f(x) = 27\,x^7$

$$F(x) = \int f(x)\,dx = \int 27\,x^7\,dx = \frac{27}{8}\,x^8 + C$$

9. $f(x) = 60\,x^5$

$$F(x) = \int f(x)\,dx = \int 60\,x^5\,dx = 10\,x^6 + C$$

10. $f(x) = 75 \sin(3x)$

$$F(x) = \int f(x)\,dx = \int 75 \sin(3x)\,dx = -25 \cos(3x) + C$$