Section 4.8: Antiderivatives - Worksheet

1. Evaluate the following antiderivatives.

(a) $\displaystyle\int \frac{7}{1+x^2}\,dx$

(b) $\displaystyle\int \frac{3}{\sqrt{16-x^2}}\,dx$

(c) $\displaystyle\int (3x+1)\left(x^2 - \frac{5}{x}\right)\,dx$

(d) $\displaystyle\int \left(e^{5x} + \cos(1)\right)\,dx$

(e) $\displaystyle\int \left(5\sqrt[7]{x^3} + \frac{4}{81+x^2}\right)\,dx$

(f) $\displaystyle\int \csc(5\theta)\left(\sin(5\theta) - \cot(5\theta)\right)\,d\theta$

(g) $\displaystyle\int \frac{7t-11}{\sqrt{t}}\,dt$

(h) $\displaystyle\int \left(2^x - \frac{1}{7x}\right)\,dx$

(i) $\displaystyle\int \frac{\tan(3x) + 5\sec(3x)}{\cos(3x)}\,dx$

(j) $\displaystyle\int \left(\frac{1}{z^{7/4}} - \frac{3}{36+z^2}\right)\,dz$

2. Solve the following initial value problems.

(a) $\dfrac{dy}{dx} = 2 - 7x$ and $y(2) = 0$.

(b) $\dfrac{dy}{dx} = x^{-6} + \dfrac{6}{x}$ and $y(1) = 3$.

(c) $\dfrac{dy}{dx} = \dfrac{5}{9+x^2}$ and $y(3) = -1$.

(d) $\dfrac{dy}{dx} = \dfrac{1}{\sqrt{64-x^2}}$ and $y(-4) = 0$.

(e) $\dfrac{d^2y}{dx^2} = 3 - e^{2x}$, $y'(0) = 1$ and $y(0) = 7$.