

## Math 155 Worksheet 14

Name:

ID:

1. Find the most general antiderivative of each of the functions below. Check your answer by differentiation.

(a)  $f(x) = 3e^x + 7\sec^2(x)$ .

(b)  $f(x) = \frac{5 - 4x^3 + 2x^6}{x^6}$ .

(c)  $f(x) = \frac{2}{1+x^2} + \frac{1}{\sqrt{1-x^2}}$ .

(d)  $f(x) = \frac{2}{x} + \sin(x) - \frac{3}{x\sqrt{x^2-1}}$ .

2. Given  $f(x) = 4 - 3(1 + x^2)^{-1}$ , find the antiderivative  $F$  of  $f$  satisfying the condition  $F(1) = 0$ .

3. A particle is moving with the given velocity  $v(t) = \sin(t) - \cos(t)$ . If the position at time  $t = 0$  is  $s(0) = 1$ , find the position  $s(t)$  of the particle.

4. Given  $f''(x) = 2 + x^3 + x^6$ , find  $f$ .

5. Given  $f''(x) = 2e^x + 3\sin(x)$ , find  $f$ .