

**Sample Test II**  
Math 166, Section A2

**Useful Formulas:**

$$\begin{aligned}\sin^2(x) + \cos^2(x) &= 1 \\ \tan^2(x) + 1 &= \sec^2(x) \\ \cos^2(x) &= \frac{1 + \cos(2x)}{2} \\ \sin^2(x) &= \frac{1 - \cos(2x)}{2}\end{aligned}$$

1.  $\int \frac{x^2 + x - 3}{x - 2}$
2.  $\int \cos^2(3x) dx$
3.  $\int \frac{4x}{x^2 + 9} dx$
4.  $\int \ln(x) dx$
5.  $\int \frac{2x}{x^2 - 5x + 6} dx$
6.  $\int \frac{1}{x^2 \sqrt{16 - x^2}} dx$  using  $x = 4 \cos(\theta)$ .
7.  $\int \frac{\cot(x)}{\sin^2(x)} dx$
8.  $\lim_{x \rightarrow 0} \frac{x^2}{\sin(x)}$
9.  $\int_3^5 \frac{1}{x - 3} dx$
10.  $\int \frac{1}{1 - \sin(x)} dx$