MATH 137 Properties of Integrals Fall 2015

1. $\int_a^b c \ dx = c(b-a)$, where c is any constant

2. $\int_a^b [f(x) \pm g(x)] \ dx = \int_a^b f(x) \ dx \pm \int_a^b g(x) \ dx$

3. $\int_a^b c \cdot f(x) \ dx = c \cdot \int_a^b f(x) \ dx$, where c is any constant

4. $\int_a^b f(x) \ dx = \int_a^c f(x) \ dx + \int_c^b f(x) \ dx$

5. If $f(x) \geq 0$ for $a \leq x \leq b$, then $\int_a^b f(x) \ dx \geq 0$

6. If $f(x) \geq g(x)$ for $a \leq x \leq b$, then $\int_a^b f(x) \ dx \geq \int_a^b g(x) \ dx$

7. If $m \leq f(x) \leq M$ for $a \leq x \leq b$, then $m(b-a) \leq \int_a^b f(x) \ dx \leq M(b-a)$

8. If f is an even function, $\int_{-a}^a f(x) \ dx = 2 \int_0^a f(x) \ dx$

9. If f is an odd function, $\int_{-a}^a f(x) \ dx = 0$

10. $\int_a^b f(x) \ dx = - \int_b^a f(x) \ dx$