Announcements

- Assigned reading for the week: sections 6.5, 7.1 and 7.2
- Homework #4B and 4C Due Friday, October 28, 11:00pm
- Printout and bring the Worksheet "Integration by parts" with you Tomorrow, Thursday, October 27 for TA sections
- Homework #5 (125 HW # 5ABC, all 3 parts) Due Wednesday, November 2, 11:00pm (complete before section, Tuesday 11/1)
- Quiz #4 (taken from HW # 4BC and/or 5AB) Tuesday, November 1 in TA sections
- Midterm #1: median = 40 and mean = 38.3
  - ▶ You should have received Solutions yesterday.
  - ▶ Requests for corrections to arithmetic errors in the midterm grade must be made in writing and handed in, with your exam, to either me or your TA by the end of this week.

Today

- 7.1 Integration by Parts

Integration by Parts

Formula for Integration by Parts

$$\int f(x)g'(x)\, dx = f(x)g(x) - \int f'(x)g(x)\, dx$$

Setting $u = f(x)$ and $v = g(x)$ we have

$$du = f'(x)dx \qquad \text{and} \qquad dv = g'(x)dx$$

so we can also write the integration by parts rule as

$$\int u\, dv = uv - \int v\, du$$

(which is easier to remember).

For Definite Integrals:

$$\int_a^b f(x)g'(x)\, dx = f(x)g(x)\big|_a^b - \int_a^b f'(x)g(x)\, dx$$

Trigonometric identities

- $\sin^2 x + \cos^2 x = 1$

- $\sin^2 x = \dfrac{1}{2}(1 - \cos 2x)$

- $\cos^2 x = \dfrac{1}{2}(1 + \cos 2x)$

- $\sin x \cos x = \dfrac{1}{2}\sin 2x$

- $\sin a \cos b = \dfrac{1}{2}[\sin(a - b) + \sin(a + b)]$

- $\sin a \sin b = \dfrac{1}{2}[\cos(a - b) - \cos(a + b)]$

- $\cos a \cos b = \dfrac{1}{2}[\cos(a - b) + \cos(a + b)]$