Math 132 - October 2, 2017

Sections Covered: 7.1

Integration by Parts:

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

Warm-up Problems

1. **Clicker** The integral below can be done with integration by parts:

   $$\int (\ln x)^2\,dx$$

   What is a good choice for u?

   (a) 1
   (b) $\ln x$
   (c) $(\ln x)^2$
   (d) dx
   (e) It can't be done by integration by parts.

2. In Problem 1, what is v?

Class Problems

3. $\int e^x \cos x\,dx$

4. $\int e^x \sin x\,dx$

5. $\int e^{3x} \cos 4x\,dx$

6. $\int x^2 e^{3x}\,dx$

7. $\int x^3 e^{3x}\,dx$

8. $\int x \sin x \cos x\,dx$

9. $\int x \ln x\,dx$

10. $\int \frac{\ln x}{x^5}\,dx$.

11. $\int \arctan x\,dx$

12. $\int 2x \arctan x\,dx$

13. **Clicker** Choose the correct u if using integration by parts: $\int (\text{Polynomial}(x))e^x \, dx$

(a) $u = 1$ (b) $u = \text{Polynomial}(x)$ (c) $u = e^x$ (d) $u = \sin x$ (e) $u = \cos x$

14. **Clicker** Choose the correct u if using integration by parts: $\int (\text{Polynomial}(x)) \sin x \, dx$

(a) $u = 1$ (b) $u = \text{Polynomial}(x)$ (c) $u = e^x$ (d) $u = \sin x$ (e) $u = \cos x$

15. **Clicker** Choose the correct u if using integration by parts: $\int (\text{Polynomial}(x)) \cos x \, dx$

(a) $u = 1$ (b) $u = \text{Polynomial}(x)$ (c) $u = e^x$ (d) $u = \sin x$ (e) $u = \cos x$

16. **Clicker** Choose the correct u if using integration by parts: $\int e^x \sin x \, dx$

(a) $u = 1$ (b) $u = e^x$ (c) $u = \sin x$ (d) $u = \cos x$ (e) $u = \ln x$

17. **Clicker** Choose the correct u if using integration by parts: $\int e^x \cos x \, dx$

(a) $u = 1$ (b) $u = e^x$ (c) $u = \sin x$ (d) $u = \cos x$ (e) $u = \ln x$

18. **Clicker** Choose the correct u if using integration by parts: $\int \ln x \, dx$ (a) $u = 1$ (b) $u = e^x$ (c) $u = \sin x$ (d) $u = \cos x$ (e) $u = \ln x$

19. $\int \sin x \cos x \, dx$