HOMEWORK DAY 12 – *Trigonometric integrals §7.2 (examples 1-6,9)*

1. Evaluate the following integrals.

   (a) $\displaystyle\int \sin^3 x \cos^2 x \, dx$

   (b) $\displaystyle\int_0^{\pi/2} \cos^9 x \sin^5 x \, dx$

(c) $\displaystyle\int_0^{\pi/2} \cos^2 t\, dt$

(d) $\displaystyle\int \tan x \sec^3 x\, dx$

(e) $\displaystyle\int_{0}^{\pi/2} \cos^5(t)\, dt$

(f) $\displaystyle\int_{0}^{\pi/4} \sin^2(2\theta)\, d\theta$

(g) $\int \tan^2 x \, dx$

(h) $\int \dfrac{\cos^5 \alpha}{\sqrt{\sin \alpha}} \, d\alpha$

2. (a) Evaluate $\int \sin(3x) \cos(5x) \, dx$ using the appropriate identities in §7.2, Formula 2.

(b) Evaluate $\int \sin(3x)\cos(5x)\,dx$ using integration by parts.

(c) Evaluate $\int_0^{2\pi} \sin(3x)\cos(5x)\,dx$.

Evaluate the following integrals, using any method of your choice.

3. $\int \dfrac{x^3}{\sqrt{1-x^2}}\, dx$

4. $\int \dfrac{x^3}{4+x^2}\, dx$

5. $\displaystyle\int_0^{1/2} x\sqrt{1-4x^2}\,dx$

6. $\displaystyle\int_2^3 \frac{dx}{(x^2 - 1)^{3/2}}$

7. $\displaystyle\int_0^2 \frac{dt}{\sqrt{4+t^2}}$

8. §7.4: 1a

9. §7.4: 7

10. §7.4: 11

11. §7.4: 15

12. §7.4: 16

13. §7.4: 18

14. §7.4: 21

15. §7.4: 51