Homework 8 - Solutions

Math 2L03

1. $\lim_{n\to\infty} \sum_{i=1}^{n} \sqrt[4]{x_i} \cdot \Delta x,\ \Delta x = \frac{16}{n},\ x_i = \frac{16 \cdot i}{n}$

2. a) $\int_0^{\pi} x \sin x dx$

   b) $\int_1^5 \frac{x}{1+x} dx$

3. a) $\frac{5}{2}$

   b) 6

4. 24

5. 0

6. a) 18
   b) $\frac{156}{7}$
   c) $\frac{-63}{4}$
   d) $1 + \frac{\pi}{4}$
   e) $-\frac{1}{2}\cos(x^2) + C$
   f) $\frac{1}{2}\tan(2\theta) + C$
   g) $-2\cos\sqrt{x}$
   h) $\frac{52}{9}$
   i) $\frac{15}{4}$
   j) $\ln|3 + \tan u| + C$
   k) $-\frac{\cos(e^{x+2})}{e^2} + C$
   l) $-\frac{1}{2}e^{1/x^2} + C$
   m) $\frac{5}{6}(e^x + 9)^{6/5} + C$
   n) $\frac{x^7}{7} + \frac{6^x}{\ln 6} + C$
   o) $\frac{(\ln x)^2}{2\ln 6} + C$
   p) $e^{\tan\theta} + C$
   q) $\sin(\ln u) + C$

7.

8. 3464

9. $C(x) = 0.5x^3 - 5x^2 + 100x + 50$

10. a) $g'(x) = \sqrt{x^2 + 1}$
    b) $h'(x) = \cos(x^4) \cdot 4x^3$
    c) $p'(x) = 2x\sqrt{\sin^2(x^2) + 2} - \sqrt{\sin^2 x + 2}$

11. 0

12. 1 (Use integration by parts twice)

13. $2\sqrt{\theta}\sin\sqrt{\theta} + 2\cos\sqrt{\theta} + C$

14. Use change of variable $u = f(x)$

15. 2 (Hint: Use the substitution $x = u^2$)

16. (a) $\frac{8}{3}$

    (b) $\frac{1}{14}$