

# MATH141 – Autumn 2008

## Tutorial Sheet – Week 13

Solutions available as of Friday at the MATH141 web site:  
<http://www.uow.edu.au/~mnelson/teaching.dir/math141.html>

1. Find the distance between the point  $A(1, -2, 3)$  and the plane  $2x - 2y + z = 4$ .
2. Evaluate the integral  $\int \left( \frac{12}{x} + x^5 \right) dx$ .
3. Let  $\mathcal{P}_1$  be the plane  $x + y + z = 2$  and  $\mathcal{P}_2$  be the plane  $y - z + 1 = 0$ .
  - (a) Find the linear form for the equation of the plane  $\mathcal{P}_3$  which contains the line of intersection of  $\mathcal{P}_1$  and  $\mathcal{P}_2$ , and which contains the point  $A(1, 0, 0)$ .
  - (b) Find the angle between the planes  $\mathcal{P}_1$  and  $\mathcal{P}_2$ .
4. Evaluate the integral  $\int \frac{1}{x\sqrt{10-x^2}} dx$ .
5. Find  $\mathcal{L} \cap \mathcal{P}$ , where  $\mathcal{P}$  is the plane  $x - 3y + 5z = 12$ , and  $\mathcal{L}$  is the line  $\frac{x-3}{8} = \frac{y-4}{5} = \frac{z+3}{-1}$ .
6. Evaluate the integral  $\int_e^{3e} \sqrt{x^2 + e^2} dx$ .
7. Evaluate the integral  $\int \frac{1}{c \ln c} dc$ .
8. Evaluate the integral  $\int \tan x dx$  (use a substitution).

### Week 13 Lecture Material

#### FUNDAMENTALS

(Mark Nelson)  
 Sections 3.3.5 & 3.3.6  
**Exercises 3.3.7**

#### ALGEBRA

(Nirmalendu Chaudhuri)  
 Sections 6.14.3 & 6.14.4  
**Exercises 6.15**