

## Quiz 2

This quiz is graded out of 10 marks. No books, calculators, notes or cell phones are allowed. You must show all your work, the correct answer is worth 1 mark the remaining marks are given for the work. If you need more space for your answer use the back of the page.

**Question 1.** (1 mark each) Integrate the following indefinite integrals:

a.

$$\int \frac{1}{x^{1/3}} dx = \int x^{-1/3} dx = \frac{3x^{2/3}}{2} + C$$

b.

$$\int \sec x dx = \ln |\sec x + \tan x| + C$$

c.

$$\int \cot x dx = \ln |\sin x| + C$$

d.

$$\int \frac{1}{x\sqrt{x^2-11}} dx = \frac{1}{\sqrt{11}} \operatorname{arccsc} \left( \frac{x}{\sqrt{11}} \right) + C$$

e.

$$\int \frac{1}{x} dx = \ln |x| + C$$

f.

$$\int \sin x dx = -\cos x + C$$

**Question 2.** (4 marks) §4.7 #31 Find  $f$ .

$$f''(\theta) = \sin \theta + \cos \theta \quad f(0) = 3, \quad f'(0) = 4$$

$$f'(\theta) = \int f''(\theta) d\theta = \int \sin \theta + \cos \theta d\theta = -\cos \theta + \sin \theta + C$$

$$4 = f'(0) \Leftrightarrow 4 = \cos 0 + \sin 0 + C \Rightarrow C = 5$$

$$f(\theta) = \int f'(\theta) d\theta = \int -\cos \theta + \sin \theta + 5 d\theta = -\sin \theta - \cos \theta + 5\theta + D$$

$$3 = f(0)$$

$$3 = -\sin(0) - \cos(0) + 5(0) + D$$

$$D = 4$$

$$\therefore f(\theta) = -\sin \theta - \cos \theta + 5\theta + 4$$