

Department: Mathematics Third class Subject: Maple Time:60 minutes

Q1. Give the commands in Maple for the following. (5 marks)

1. Graph the functions $\sin(x - y)$ for $-\pi \leq x \leq \pi$ and $\cos(x + y)$ for $0 \leq x \leq 2\pi$ in one figure with two different colors.

2. Find the value of the function

$$f(t) = \begin{cases} \frac{\sin t}{t} & \text{if } t > 0 \\ 2t + 3 & \text{if } t = 0 \\ t^2 - 1 & \text{if } t < 0 \end{cases} \text{ at } t = \frac{\pi}{5} \text{ and } t = -e.$$

Q2. The following table shows some Maple commands, together with the output that the user expected to get. In each case, the command has one or more errors, so the output not to be as expected. Give a corrected version of each command. (5 marks).

No	Input	Expected output
1	Factor($x^3 - 9x^2y + 27xy^2 - 27y^3$):	$(x - 3y)^3$
2	eval(e,20)	2.718281828
3	solved($\frac{a^2c^2 - 4b^2}{b} = a^6b - 4a^3b$);	$\left\{c = \frac{b(a^3 - 2)}{a}\right\}, \left\{c = -\frac{b(a^3 - 2)}{a}\right\}$
4	simplify($x^3 - y^3, x + y, 'r'$)	false
5	diff($x^2 + y^3 = -1, x, x$)	$-\frac{2}{9} \frac{3y^3 + 4x^2}{y^5}$