

Mathematics 1001H – Precalculus Mathematics

TRENT UNIVERSITY, Summer 2016

MATH 1001H Test

Tuesday, 31 May, 2016

Time: 60 minutes

Instructions

- Show all your work. Legibly, if possible!
- If you have a question, ask it!
- Use the back sides of the test sheets for rough work or extra space.
- You may use a calculator and an aid sheet.

1. Solve for x as best you can in any *four* (4) of **a–f**. [12 = 4 × 3 each]

a. $\log_2(x - 2) = 2$

b. $x^2 + 2x + 1 = 0$

c. $|x - 3| = 2$

d. $\sin^2(x) = \frac{3}{4}$

e. $10^{2x+1} = 0.001$

f. $\tan^{-1}(x) = -45^\circ$

2. Do any *two* (2) of **a–c**. [10 = 2 × 5 each]

a. Suppose that $\cos(\alpha) = \frac{12}{13}$. Compute each of:

i. $\sin(\alpha)$ [1] *ii.* $\tan(\alpha)$ [1] *iii.* $\sec(\alpha)$ [1] *iv.* $\sin(2\alpha)$ [1] *v.* $\cos(2\alpha)$ [1]

b. Sketch the graphs of: *i.* $y = e^x$ [1] *ii.* $y = e^{-x}$ [1] *iii.* $y = \frac{e^x + e^{-x}}{2}$ [1.5]

iv. At what point(s), if any, do the graphs of these functions intersect? [1.5]

c. Let $f(x) = 2x + |x|$. *i.* Sketch the graph of $y = f(x)$. [2]

ii. Find the inverse function, $f^{-1}(x)$, of $f(x)$. [3]

3. Do *all three* of **a–c**. [8]

a. Find the equation of the line passing through both (1, 2) and (4, 5) and sketch the line. [2]

b. Find the location of the tip of the parabola given by $y = x^2 - 4x + 5$ and sketch the parabola. [4]

c. Find all the points of intersection, if any, of the line in **a** and the parabola in **b**. [2]

[Total = 30]