MTH1002 Practice test C answers

1. $f(x)$: Domain : $[-1, 1]$
Range : $[0, 1]$
$g(x)$: Domain : $\{x \in \mathbb{R} : x \neq b\}$
Range : $(0, \infty)$

Similar questions : Practical 1, Q1
Notes 1, p. 4, p. 8

2. $\lim_{t \to 3} \dfrac{t^2 - 9}{t - 3} = 6$

$\lim_{u \to \infty} u^2 e^{-u} = 0$ [Hint: $u^2 e^{-u} = u^2 / e^u$]

Similar questions: Practical 4, Q1, Q2, Q6.
Notes 4, pp. 3 - 4

3. $f'(x) = 2x + 1$ $\quad g'(x) = -\frac{1}{2} x^{-3/2}$

Similar questions: Practical 5, Q5
Notes 4, pp. 14 - 15

4. $z = 2\sqrt{2} \left(\cos \pi/4 + i \sin \pi/4 \right)$

$= 2\sqrt{2} \exp(i\pi/4)$

Similar questions : Practical 2, Q6; Practical 3, Q1.
Coursework, Q4
Notes 2, pp. 9-10; Notes 3, pp. 2-3

5. -4 $+4$;

Similar questions : Practical 3, Q4, Q5

6. Critical points at $x = 3$ and $x = 5/2$

Similar questions : Notes 6, p. 9
Practical 6, q. 1

7. $(-\infty, 0)$ Increasing
$(0, 1)$ Decreasing
$(1, 2)$ Decreasing
$(2, \infty)$ Increasing

Similar questions : Notes 6, p. 13
Practical 6, qq. 3 and 9