

TEST #1 Practice

Max = 26

Student Number: \_\_\_\_\_

- Time: 80 min.
- Only basic scientific calculators are permitted: non-programmable, non-graphing, no differentiation or integration capability. Notes or books are not permitted.
- Work all problems in the space provided. Use the backs of the pages for rough work if necessary. Do not use any other paper.
- Write *only* in non-erasable ink (ball-point or pen), not in pencil. Cross out, if necessary, but do not erase or overwrite. Graphs and sketches may be drawn in pencil.
- Problems require complete and clearly presented solutions and carry part marks if there is substantial correct work toward the solution.

1. [2 points] Solve:  $\ln(x - 2) + \ln(2x) = \ln 6$ .

2. [2 points] Find the domain of the function:  $h(x) = \frac{-30}{\ln|-3x - 2|}$ .

3. [2 points] If  $f(x) = x^{34} - 3x^2 + 6x + 666$ , find  $f'(1)$ .

4. [5 points] a) Give the formula for  $f'(a)$ , the derivative of  $f(x)$  at  $a$ .
- b) Use a) to find  $f'(a)$  if  $f(x) = \frac{2}{x+2}$ .
- c) Find the equation of the tangent line to the graph of  $f(x)$  at  $x = 1$ , where  $f(x) = \frac{2}{x+2}$ .

**5.** [5 points] Find the limits:

a)  $\lim_{x \rightarrow \frac{\pi}{2}} 2 \ln(\sin(x))$

b)  $\lim_{x \rightarrow \infty} \ln\left(\frac{6x^2}{9x^2 + 13000}\right)$

6. [5 points] Find the values (if any) of  $d$  such that the function is continuous.

$$f(x) = \begin{cases} 6x & \text{if } x < 1 \\ (4x + d)^2 & \text{if } x \geq 1 \end{cases}$$

7. [5 points] Find  $f''(x)$ ,  $g'(x)$  and  $h'(x)$  if  $f(x) = -67e^x - 44 \cos x$ ;

$$g(x) = \frac{6e^x}{\sin(x)};$$

$$h(x) = 3x^{2814} - 3x + 67.$$

## Rough Work