

SPRING 2006

# Review Quiz

MATH 85

Department of Mathematics  
Temple University

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Name: \_\_\_\_\_

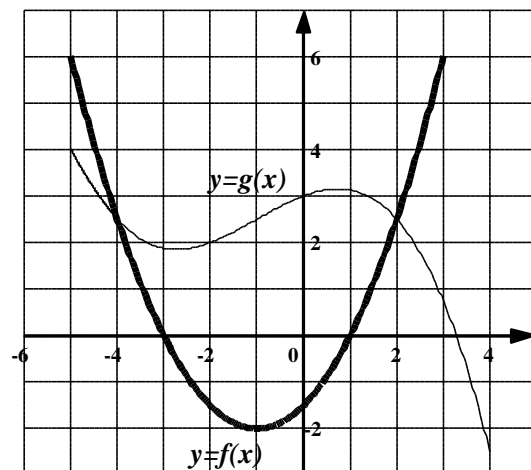
Instructor/Section: \_\_\_\_\_

This exam consists of 9 questions. Show all your work. **No work, no credit.** Good Luck!

Question	Points	Out of
1		14
2		4
3		3
4		4
5		4
6		3
7		8
8		6
9		4
<b>Total</b>		<b>50</b>

14pt **1.** The graphs of two functions,  $f(x)$  (in bold line) and  $g(x)$  (in lighter line), are shown below.

- (a) State the values of  $f(-1)$  and  $g(0)$ .
- (b) For what values of  $x$  is  $f(x) = g(x)$ ?
- (c) Estimate the solution of the equation  $f(x) = -1.5$ .
- (d) On what interval is  $f$  decreasing?
- (e) State the domain and range of  $f$  (i.e.,  $D_f$  and  $R_f$ ).



(f) State the domain and range of  $g$  (i.e.,  $D_g$  and  $R_g$ ).

(g) Evaluate. Show your steps.

$$(f \circ g)(0)$$

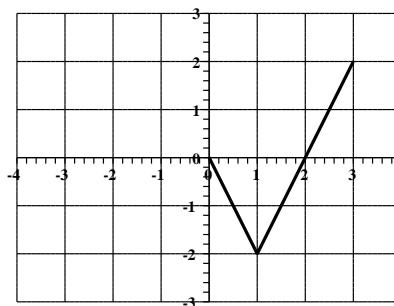
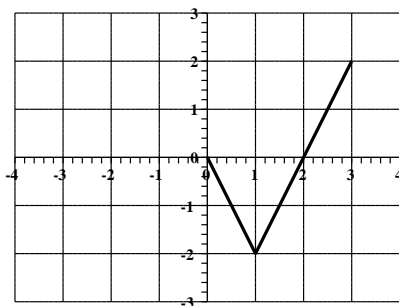
$$(g \circ f)(-1)$$

$$(f \circ f)(-3)$$

4pt **2.** The function  $f$  has domain  $[-3, 3]$  and a portion of the graph is shown.

(a) Complete the graph of  $f$  if it is **even**.

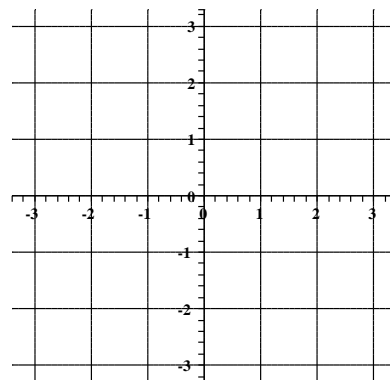
(b) Complete the graph of  $f$  if it is **odd**.



3pt **3.** Find the domain of the function  $f(x) = \frac{\sqrt{x}}{x-2}$  (express your answer in interval form).

4pt **4.** Find the domain and sketch the graph of the function

$$f(x) = \begin{cases} 1 - x & \text{if } -2 \leq x \leq 1 \\ x - 3 & \text{if } 1 < x \leq 3 \end{cases}$$



4pt **5.** Write equations for the graphs that are obtained from the graph  $y = e^x$  as follows.

(a) Shift 2 units downward:  $y =$  (c) Stretch vertically by a factor of 2.  $y =$

(b) Shift 2 units to the right:  $y =$  (d) Reflect about the  $y$ -axis.  $y =$

3pt **6.** Express in the form  $f \circ g \circ h$  the function  $H(x) = \sin^2(\sqrt{x})$ .

$$f(x) =$$

$$g(x) =$$

$$h(x) =$$

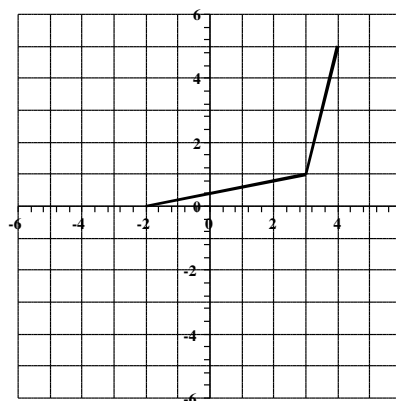
8pt **7.** The graph of  $f$  is given.

(a) Why is  $f$  one-to-one?

(b) State the domain and the range of  $f^{-1}$  (the inverse of  $f$ ).

(c) Estimate the values  $f^{-1}(0)$ ,  $f^{-1}(1)$ , and  $f^{-1}(5)$

(d) Sketch the graph of  $f^{-1}$  on the same grid.



6pt **8.** Find the exact value.

(a)  $\log_3 \frac{1}{27}$

(b)  $\log_2 10 + \log_2 20 - 2 \log_2 5$

(c)  $e^{2 \ln 7}$

4pt **9.** Solve for  $x$ .

(a)  $\ln(x - 1) + \ln 3 = \ln(2x + 1)$

(b)  $e^{2x} = 4$