AP Calc. AB - Exam 3 Practice Problems
Exam date: September 7 Name: _____

x	1	2	3	4	5	6
$f(x)$	2	4	4	6	3	1
$g(x)$	1	1	1	5	2	5
$h(x)$	4	4	3	1	2	2

1. Using the table above, evaluate the following:

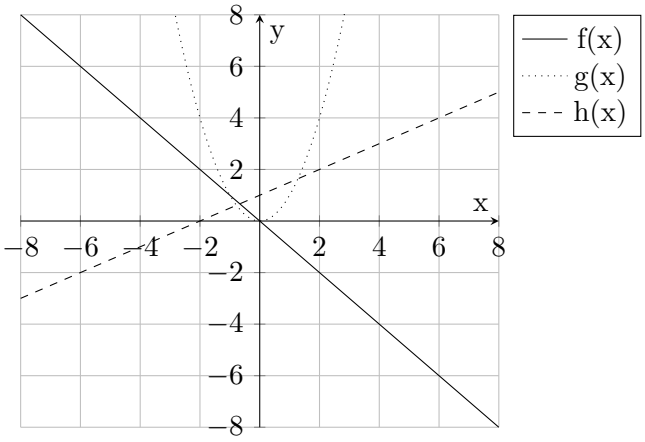
   (a) $f(h(f(1))) \div (f \circ g)(2)$

   (b) $(h \circ g \circ f)(5)$

   (c) $g(f(3)) - h(h(2))$

   (d) $(f \circ g)(h(f(4)))$

2. From the graphs of f, g, and h below, estimate the values of $g(f(h(x))$ for $\{x \,\epsilon\, \mathbb{Z} \mid -3 \leq x \leq 3\}$.



3. From f and g defined below, evaluate each expression or state why it is undefined.

$$f(x) = -|x+2| - 3,\ g(x) = \begin{cases} -x & \text{if } x < 0 \\ x^2 & \text{if } x \geq 0 \end{cases}$$

   (a) $(f \circ g)(3) - g(f(2))$

   (b) $(fg)(-2) + g(-6)$

   (c) $(f \circ f)(-3) \div g(2)$

   (d) $\left(\frac{f}{g}\right)(0)$

4. For each part, find the following functions and their domains: $(f \circ g)$, $(g \circ f)$, $(f \circ f)$, and $(g \circ g)$.

   (a) $f(x) = x^2,\ g(x) = 2x - 1$

   (b) $f(x) = \sqrt{x^2 - \frac{1}{2}},\ g(x) = \sin(x)$

5. Find $f \circ g \circ h$.

   (a) $f(x) = \sqrt{\frac{1}{1-x^2}},\ g(x) = e^{2x},\ h(x) = \sin(x)$

   (b) $f(x) = \tan(x),\ g(x) = \tan^{-1}(x),\ h(x) = e^x$

6. Express each function in the form $f \circ g$:

(a) $A(x) = \ln\left(\frac{1}{x^{\frac{1}{x}}}\right)$

(b) $B(x) = \frac{\left(x^2-2x+1\right)(x+1)^2}{(x^2-1)(x^2)}$