

4. [15 points] In the following problems, circle all of the statements that *could* be true and draw a line through all of the statements that *could not* be true, based on the given information. (Every statement should be either circled or crossed out.) No explanation is necessary.

a. [3 points] A brief table of values for  $f(x)$  and  $g(x)$  is given, rounded to 4 decimal places:

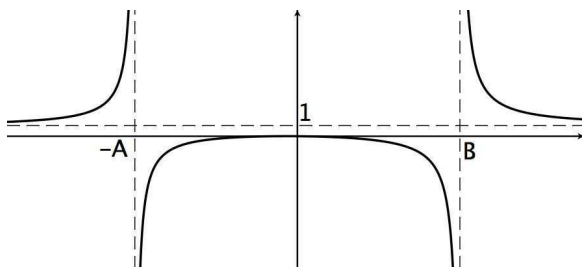
$x$	$f(x)$	$g(x)$
1.25	2.4414	1.1265
1.5	5.0625	1.1547
1.75	9.3789	1.1836

- $f(x)$  is exponential and  $g(x)$  is a power function.
- $f(x)$  is a power function and  $g(x)$  is exponential.
- $f(x)$  and  $g(x)$  are both exponential.

b. [4 points] Suppose that  $f(x)$  is a continuous function and  $\lim_{x \rightarrow \infty} f(x) = 2$ .

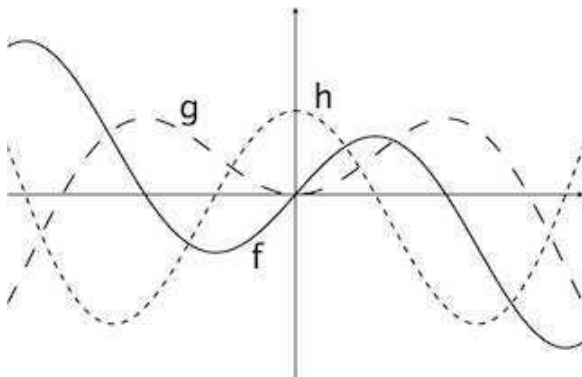
- For all  $x > 10$ ,  $f''(x) > 0$  and  $f'(x) > 0$ .
- For all  $x > 10$ ,  $f''(x) > 0$  and  $f'(x) < 0$ .
- For all  $x > 10$ ,  $f''(x) < 0$  and  $f'(x) > 0$ .
- For all  $x > 10$ ,  $f''(x) < 0$  and  $f'(x) < 0$ .

c. [4 points] A rational function  $r(x)$  is graphed below (with  $A \neq B$ ):



- $r(x) = \frac{x^2}{(x+A)(x-B)}$
- $r(x) = \frac{x}{(x+A)(x-B)}$
- $r(x) = \frac{4x^2}{(x+A)(x-B)}$
- $r(x) = \frac{x^2}{(x-A)(x+B)}$

d. [4 points] Consider the functions  $f(x)$ ,  $g(x)$ , and  $h(x)$  graphed below.



- $f(x) = h'(x)$
- $h(x) = f'(x)$
- $h(x) = g''(x)$
- $f(x) = g'(x)$