

## Inequalities of Combined Functions

Let  $f(x) = x + 2$  and  $g(x) = (x - 2)^2 + 2$

a) Determine all regions where  $f(x) > g(x)$

b) Determine all regions where  $g(x) > f(x)$

### Compare the Functions

$$f(x) = g(x)$$

$$x + 2 = (x - 2)^2 + 2$$

$$x + 2 = x^2 - 4x + 4 + 2$$

$$0 = x^2 - 5x + 4$$

$$0 = (x - 1)(x - 4)$$

$$x = 1$$

$$x = 4$$

	$x = -3$	$x = 3$	$x = 13$
$f(x)$ $= x + 2$	$= -1$	$5$	$15$
$g(x)$ $= (x - 2)^2 + 2$	$= 27$	$3$	$123$
	$f(x) < g(x)$	$f(x) > g(x)$	$f(x) < g(x)$

$$f(x) < g(x) \rightarrow (-\infty, 1) \cup (4, \infty)$$

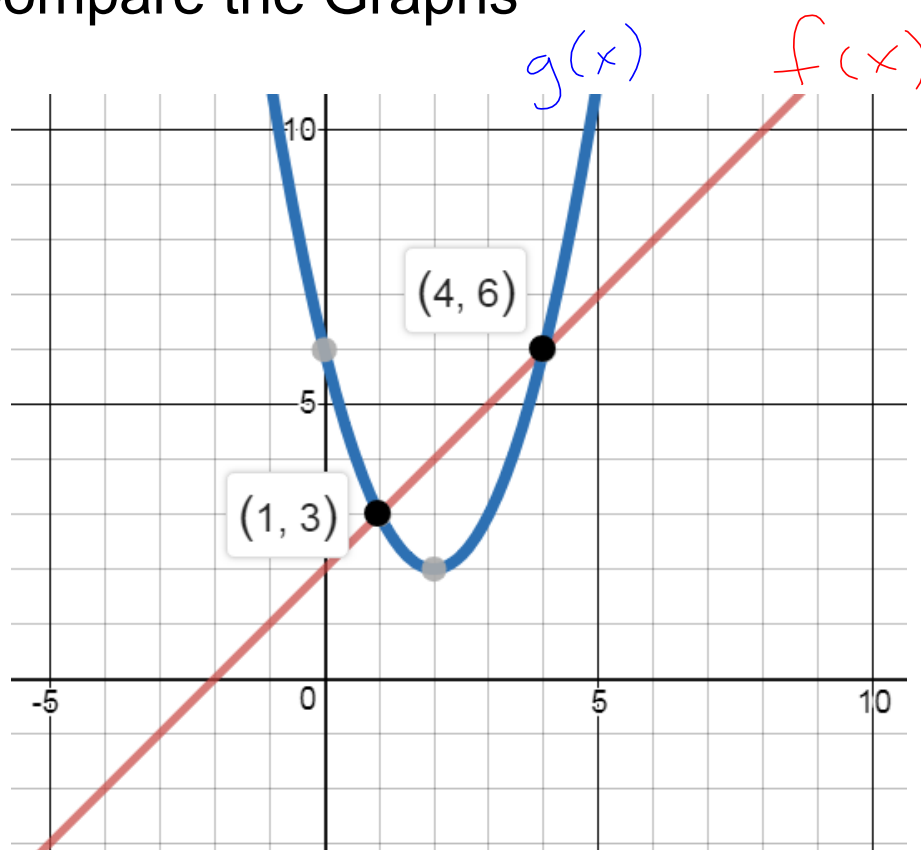
$$g(x) < f(x) \rightarrow (1, 4)$$

Let  $f(x) = x + 2$  and  $g(x) = (x - 2)^2 + 2$

a) Determine all regions where  $f(x) > g(x)$

b) Determine all regions where  $g(x) > f(x)$

### Compare the Graphs



Let  $f(x) = x + 2$  and  $g(x) = (x - 2)^2 + 2$

a) Determine all regions where  $f(x) > g(x)$

b) Determine all regions where  $g(x) > f(x)$

### Examine the Quotient

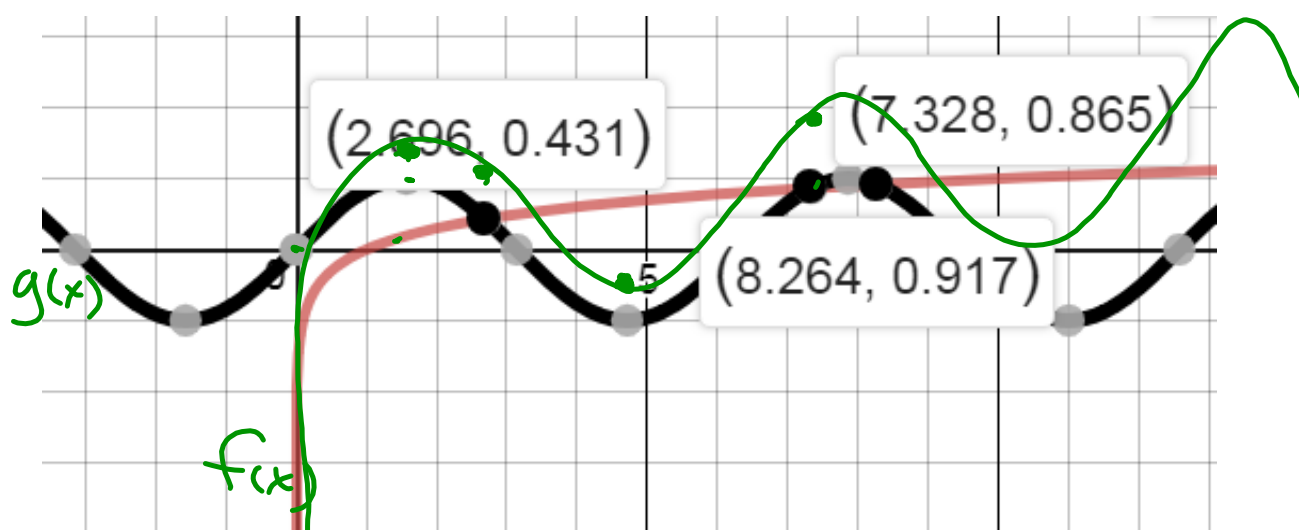
$$\frac{f(x)}{g(x)} \rightarrow \begin{array}{l} \text{if } f(x) > g(x) \\ \text{then } \frac{f(x)}{g(x)} > 1 \end{array}$$

$$\frac{x+2}{(x-2)^2+2}$$

Solve  $\sin x > \log x$  for all values of  $x$  in the domain.

$$\sin(x) \rightarrow D \rightarrow \{x \in \mathbb{R}\}$$

$$\log(x) \rightarrow D \rightarrow \{x \in \mathbb{R} \mid x > 0\}$$



$$\sin x > \log x \rightarrow (0, 2.696) \cup (7.328, 8.264)$$

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Test?