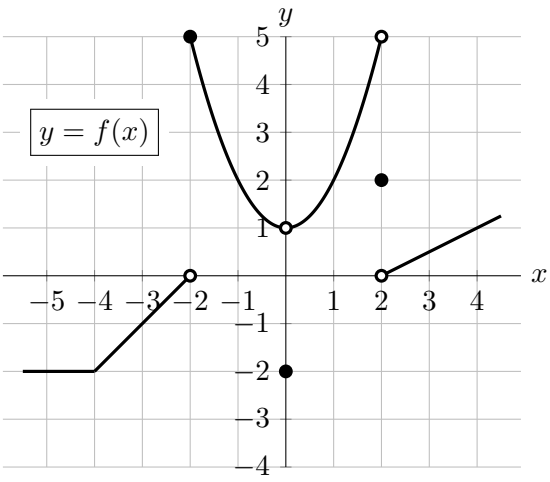
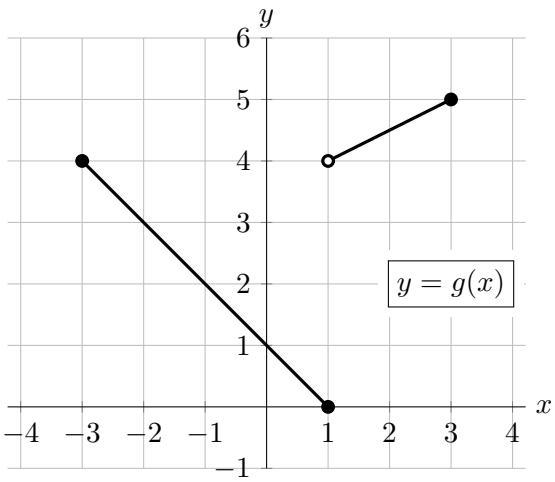
1. [19 points] The graphs of the functions $f(x)$ and $g(x)$ are shown below.





Note that the graph of $f(x)$ is linear for $x < -2$ and $x > 2$, and $g(x)$ is linear on $-3 < x < 1$ and $1 < x < 3$.

For each of the following parts, find the given limit. If any of the quantities do not exist (including the case of limits that diverge to ∞ or $-\infty$), write DNE. If the limit cannot be found based on the information given, write NOT ENOUGH INFO. *You do not need to show any work.*

a. [2 points] Find $\lim_{x \to -1} f(x)$.

$\lim_{x \to -1} f(x) =$ _____

b. [2 points] Find $\lim_{t \to 2^-} 2(f(t) - 3)$.

$\lim_{t \to 2^-} 2(f(t) - 3) =$ _____

c. [2 points] Find $\lim_{x \to 1} f(x)g(x)$.

$\lim_{x \to 1} f(x)g(x) =$ _____

d. [2 points] Find $\lim_{x \to \infty} f(e^{-x})$.

$\lim_{x \to \infty} f(e^{-x}) =$ _____

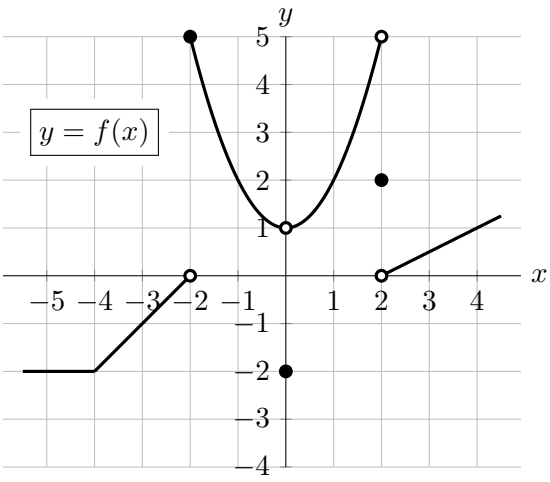
e. [2 points] Find $\lim_{x \to 2^+} g^{-1}(x)$.

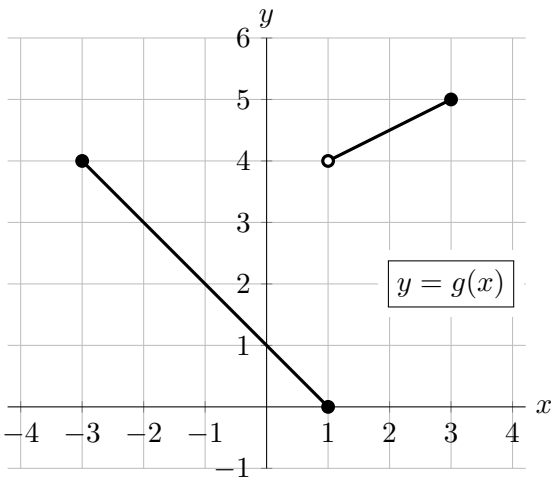
$\lim_{x \to 2^+} g^{-1}(x) =$ _____

f. [2 points] Find $\lim_{h \to 0} \dfrac{f(3+h) - f(3)}{h}$.

$\lim_{h \to 0} \dfrac{f(3+h) - f(3)}{h} =$ _____

The graphs of the functions $f(x)$ and $g(x)$ are included here for your convenience.





g. [3 points] Find all the values of x with $-5 < x < 4$ at which the function $f(x)$ is <u>not</u> continuous.

Answer: _____

h. [2 points] What is the range of $y = g(x)$?

Answer: _____

i. [2 points] For which of the following values of x is $f'(x) > 0$? Circle all that apply.

$x = -5$ $x = -1$ $x = 1.5$ $x = e$ NONE OF THESE

2. [5 points] Let

$$K(p) = (1 + \cos(p))^{1+2p}.$$

Use the limit definition of the derivative to write an explicit expression for $K'(4)$. *Your answer should not involve the letter K. Do not attempt to evaluate or simplify the limit. Please write your final answer in the answer box provided below.*

Answer: $K'(4) =$