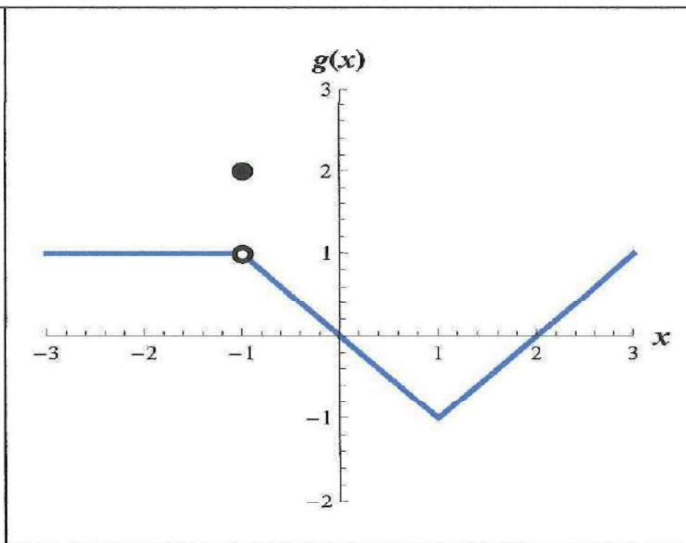
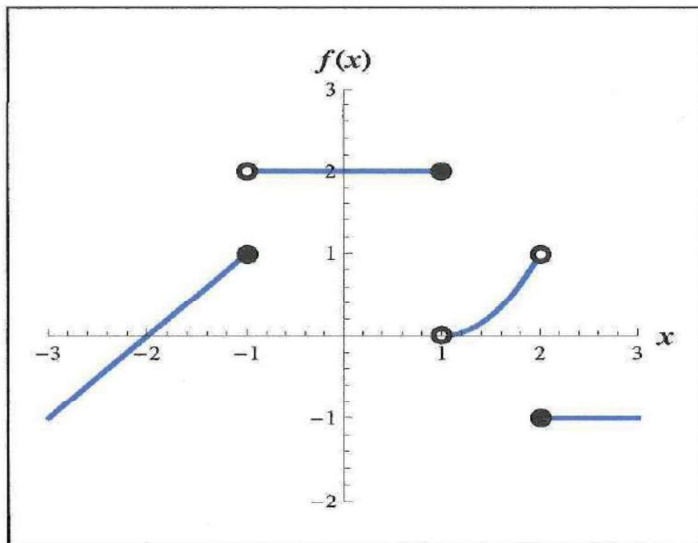
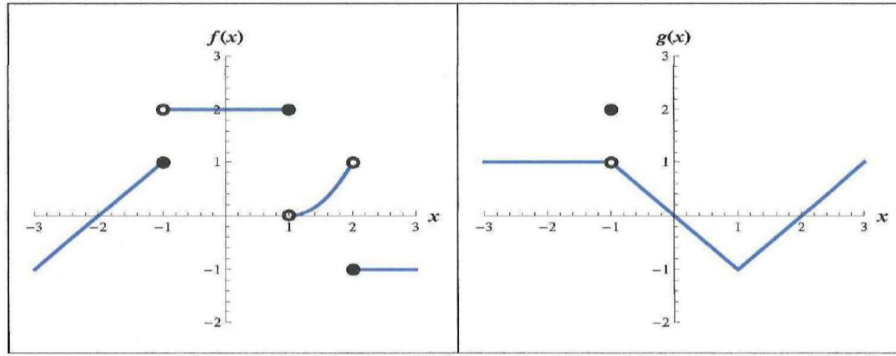


Topic 1.5 – Determining Limits Using Algebraic Properties of Limits

Using the graphs of $f(x)$ and $g(x)$ provided below, find each of the limits or state that they do not exist.



1. $\lim_{x \rightarrow -1^+} f(x) = 2$	2. $\lim_{x \rightarrow -1^-} f(x) = 1$	3. $\lim_{x \rightarrow -1} f(x)$ dne
4. $\lim_{x \rightarrow -1^+} g(x) = 1$	5. $\lim_{x \rightarrow -1^-} g(x) = 1$	6. $\lim_{x \rightarrow -1} g(x) = 1$
7. $g(-1) = 2$	8. $\lim_{x \rightarrow 1} g(x) = -1$	9. $\lim_{x \rightarrow 0} \frac{f(x)}{g(x)}$ dne. $= \frac{\lim_{x \rightarrow 0} f(x)}{\lim_{x \rightarrow 0} g(x)}$ $= \frac{2}{0}$



<p>10. $\lim_{x \rightarrow 0} \frac{g(x)}{f(x)} = 0$</p> <p>$= \frac{\lim_{x \rightarrow 0} g(x)}{\lim_{x \rightarrow 0} f(x)}$</p> <p>$= \frac{0}{2}$</p>	<p>11. $\lim_{x \rightarrow -1} [f(x) \cdot g(x)]$ dne</p> <p>$\lim_{x \rightarrow -1^-} f(x) \cdot \lim_{x \rightarrow -1^-} g(x) = 1 \cdot 1 = 1$</p> <p>$\lim_{x \rightarrow -1^+} f(x) \cdot \lim_{x \rightarrow -1^+} g(x) = 2 \cdot 1 = 2$</p>	<p>12. $\lim_{x \rightarrow 2} [f(x) \cdot g(x)] = 0$</p> <p>$\lim_{x \rightarrow 2^-} f(x) \cdot \lim_{x \rightarrow 2^-} g(x) = 1 \cdot 0 = 0$</p> <p>$\lim_{x \rightarrow 2^+} f(x) \cdot \lim_{x \rightarrow 2^+} g(x) = -1 \cdot 0 = 0$</p>
<p>13. $\lim_{x \rightarrow 0} [2f(x) + 3g(x)] = 4$</p> <p>$= 2 \cdot 2 + 3 \cdot 0$</p> <p>$= 4$</p>	<p>14. $\lim_{x \rightarrow 0^-} f(x+2) = \lim_{x \rightarrow 2^-} f(x) = 1$</p> <p>$\lim_{x \rightarrow 0^-} (x+2) = 2^-$</p>	<p>15. $\lim_{x \rightarrow -1^-} f(x^2) = \lim_{x \rightarrow 1^+} f(x) = 0$</p> <p>$\lim_{x \rightarrow -1^-} x^2 = 1^+$</p>
<p>16. $\lim_{x \rightarrow -2} g(f(x)) = \lim_{x \rightarrow 0} g(x) = 0$</p> <p>$\lim_{x \rightarrow -2} f(x) = 0$</p> <p>Both sides</p>	<p>17. $\lim_{x \rightarrow 2^-} f(f(x)) = \lim_{x \rightarrow 1^-} f(x) = 2$</p> <p>$\lim_{x \rightarrow 2^-} f(x) = 1^-$</p>	<p>18. $\lim_{x \rightarrow 2^+} f(-f(x)) = f(1) = 2$</p> <p>Not test worthy</p> <p>$\lim_{x \rightarrow 2^+} -f(x) = -(-1) = 1$</p> <p>from constant (Not above or below)</p>
<p>19. $\lim_{x \rightarrow -1} f(g(x) - 2.5) = \lim_{x \rightarrow -1.5} f(x) = \frac{1}{2}$</p> <p>$\lim_{x \rightarrow -1} (g(x) - 2.5) = 1 - 2.5 = -1.5$</p> <p>below constant</p>	<p>20. $\lim_{x \rightarrow 0} f([g(x)]^2 + 1) = \lim_{x \rightarrow 1^+} f(x) = 0$</p> <p>$\lim_{x \rightarrow 0} [g^2(x) + 1] = 0^2 + 1 = 1^+$</p> <p>upper only</p> <p>why upper only? b/c $[g(x)]^2$ making it positive</p>	