

1. Answer the questions about the functions graphed below.

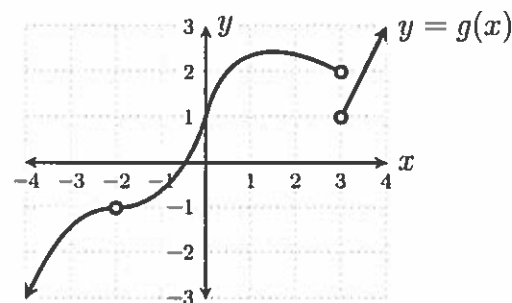
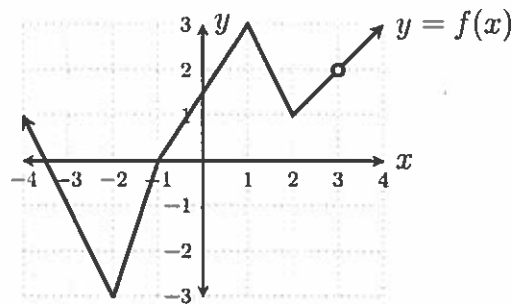
(a) $\lim_{x \rightarrow 3} f(x) = \boxed{2}$

(b) $\lim_{x \rightarrow 3^+} g(x) = \boxed{1}$

(c) $\lim_{x \rightarrow 3} g(x) = \boxed{\text{DNE}}$

(d) $\lim_{x \rightarrow 0} (2f(x) + g(x)) = 2 \cdot 1.5 + 1 = \boxed{4}$

(e) $\lim_{x \rightarrow -2} \frac{3 + g(x)}{\sqrt{12 + f(x)}} = \frac{3 + (-1)}{\sqrt{12 + (-3)}} = \frac{2}{\sqrt{9}} = \boxed{\frac{2}{3}}$



2. $\lim_{x \rightarrow 1} \frac{x^2 - 6x + 5}{x^2 - 3x - 10} = \frac{1^2 - 6 \cdot 1 + 5}{1^2 - 3 \cdot 1 - 10} = \frac{0}{-12} = \boxed{0}$

3. $\lim_{x \rightarrow 5} \frac{x^2 - 6x + 5}{x^2 - 3x - 10} = \lim_{x \rightarrow 5} \frac{(x-1)(x-5)}{(x+2)(x-5)} = \lim_{x \rightarrow 5} \frac{x-1}{x+2} = \frac{5-1}{5+2} = \boxed{\frac{4}{7}}$

4. $\lim_{h \rightarrow 0} \frac{\frac{1}{6+h} - \frac{1}{6}}{h} = \lim_{h \rightarrow 0} \frac{\frac{1}{6+h} - \frac{1}{6}}{h} \cdot \frac{6(6+h)}{6(6+h)} = \lim_{h \rightarrow 0} \frac{6 - (6+h)}{h \cdot 6(6+h)}$
 $= \lim_{h \rightarrow 0} \frac{-h}{h \cdot 6(6+h)} = \lim_{h \rightarrow 0} \frac{-1}{6(6+h)} = \frac{-1}{6(6+0)} = \boxed{-\frac{1}{36}}$

5. $\lim_{x \rightarrow \pi} \frac{x \cos(x) + x}{\cos(x) + 1} = \lim_{x \rightarrow \pi} \frac{x(\cos(x) + 1)}{\cos(x) + 1} = \lim_{x \rightarrow \pi} x = \boxed{\pi}$

6. $\lim_{x \rightarrow 0} \frac{\sin(x)}{x} = \boxed{1}$ (standard fact)