Limits and Continuity 2 – Finding Limits

Limits at a point

$$\lim_{x\to 3}(4x-7)=$$

$$\lim_{x\to 2}\cos(x)=$$

$$\lim_{x\to 2}\sqrt{6-x}=$$

$$\lim_{x\to 10}\sqrt{6-x}=$$

$$\lim_{x\to \frac{\pi}{2}}\tan(x)=$$

$$\lim_{x\to \frac{\pi}{4}}\tan(x)=$$

One-sided limits

$$\lim_{x\to 0+}\sqrt{x}=$$

$$\lim_{x\to 0-}\sqrt{x}=$$

Limits that do not exist (DNE)

$$\lim_{x\to 2}\frac{\sqrt{x^2-4x+4}}{x^3-2x^2+x-2}=\lim_{x\to 2}\frac{|x-2|}{(x-2)(x^2+1)}=$$

$$\lim_{x\to 2^+}f(x)= \qquad \lim_{x\to 2^-}f(x)= \qquad \lim_{x\to 2}f(x)=$$

Limits equal to infinity

$$\lim_{x\to 1^+} \frac{3}{x-1} =$$

$$\lim_{x\to 1^-} \frac{3}{x-1} =$$

$$\lim_{x\to 1} \frac{3}{x-1} =$$

$$\lim_{x\to 1+} \frac{3}{(x-1)^2} =$$

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2. Let f be the function given by $f(x) = 2xe^{2x}$.
   (a) Find $\lim_{x\to-\infty} f(x)$ and $\lim_{x\to\infty} f(x)$.
   (b) Find the absolute minimum value of f. Justify that your answer is an absolute minimum.
   (c) What is the range of f?
   (d) Consider the family of functions defined by $y = bxe^{bx}$, where b is a nonzero constant. Show that the absolute minimum value of bxe^{bx} is the same for all nonzero values of b.