

Limits

Questions

Compute the following limits, or show they don't exist.

Question 1. $\lim_{(x,y) \rightarrow (\pi, \pi/2)} y \sin(x - y)$

Question 2. $\lim_{(x,y) \rightarrow (2,-1)} \frac{x^2 y + x y^2}{x^2 - y^2}$

Question 3. $\lim_{(x,y) \rightarrow (0,0)} \frac{y^2 \sin^2 x}{x^4 + y^4}$

Question 4. $\lim_{(x,y) \rightarrow (0,0)} \frac{x^3 + y^3}{x^2 + y^2}$

Question 5. $\lim_{(x,y) \rightarrow (0,0)} (x^2 + y^2) \ln(x^2 + y^2)$

Question 6. $\lim_{(x,y,z) \rightarrow (0,0,0)} \frac{xy + yz^2 + xz^2}{x^2 + y^2 + z^4}$

Question 7. $\lim_{(x,y,z) \rightarrow (0,0,0)} \frac{x^2 y^2 z^2}{x^2 + y^2 + z^2}$

Question 8. $\lim_{(x,y) \rightarrow (0,0)} \frac{x^2 y + x y^2}{x^2 - y^2}$

Question 9. $\lim_{(x,y) \rightarrow (0,0)} \frac{x^3 y^3}{x^4 + y^4}$

HW problems

Here are a couple of problems from the current assigned homework. Consider if you'd be willing to present a solution to one of them at the board!

Problem (§13.1 #13). Let

$$\mathbf{r}(t) = \langle 5 - t, 4t - 3, 3t \rangle, \quad P(4, 1, 3).$$

- Find the arc length function for the curve measured from the point P in the direction of increasing t and then reparametrize the curve with respect to arc length starting from P , and
- find the point 4 units along the curve (in the direction of increasing t) from P .