

WORKSHEET IV

trigonometric limits & one-sided limits



Evaluate each of the following limits or explain why the limit fails to exist.

1. $\lim_{x \rightarrow 0} \frac{\sin 4x}{x}$

2. $\lim_{x \rightarrow 0} \frac{\tan 5x}{x}$

3. $\lim_{x \rightarrow 0} \frac{\sin 2x}{\sin 8x}$

4. $\lim_{x \rightarrow \infty} \frac{\sin 13x}{x}$

5. $\lim_{x \rightarrow 0} \frac{\cos 3x}{x}$

6. $\lim_{x \rightarrow 0^+} x \sin\left(\frac{1}{x}\right)$

7. $\lim_{x \rightarrow 0} \frac{\cos 11x}{\cos 13x}$

8. $\lim_{x \rightarrow 0} \frac{\tan^2 x}{x^2}$

$$9. \lim_{x \rightarrow 0} \frac{\sin^2 x}{x}$$

$$10. \lim_{x \rightarrow 0^+} \frac{|x|}{x}$$

$$11. \lim_{x \rightarrow 5^-} \frac{x(x-5)(x-3)^2}{|x-5|}$$

$$12. \lim_{x \rightarrow 0} \frac{\cos x - 1}{x}$$

$$13. \lim_{x \rightarrow 5} \sqrt{\frac{x-5}{x+1}}$$

$$14. \lim_{x \rightarrow 0} \frac{\sin(\sin x)}{\sin x}$$

$$15. \lim_{x \rightarrow 0} x \csc x$$

$$16. \lim_{x \rightarrow 3^-} \frac{(x+4)(x-3)}{|x-3|}$$

$$17. \lim_{x \rightarrow 0} \cos(1/x)$$

$$18. \lim_{x \rightarrow 3^-} \sqrt{9-x^2}$$

*I used to love mathematics for its own sake,
and I still do, because it allows for no
hypocrisy and no vagueness...*

- Stendhal, *The Life of Henri Brulard*