

Name: _____

Points: /25

1. Compute

$$\lim(-1)^n \sqrt{n} (\sqrt{2n+3} - \sqrt{2n-1}).$$

Points: /5

2. Does the series

$$\sum_{n=1}^{\infty} \frac{\cos(k\pi/2)}{k^2 + 1}$$

converge or diverge? Justify your claim.

Points: /5

3. Find the domain of

$$f(x, y) = \frac{1}{\ln(\sqrt{x^2 + 1})} + \ln(|y| - x)$$

and make a sketch of it.

Points: /5

4. Examine

$$\lim_{(x,y) \rightarrow (0,0)} \frac{\sin\left(\frac{x}{y}\right) x}{x + y}.$$

Points: /5

5. Write the equation of a tangent plane of function

$$f(x, y) = e^{x-y^2}(x+1)$$

at point $(x_0, y_0) = (1, 1)$.

Points: /5