

1. Find all values of x in the interval $[0, 2\pi]$ that satisfy the following inequality.

$$|\sin x| > \frac{1}{2}$$

Answer: $[\pi/6, 5\pi/6], [7\pi/6, 11\pi/6]$

2. Solve the following equation.

$$e^{2x} - 5e^x + 6 = 0$$

Answer: $x = \ln 2, x = \ln 3$

3. Evaluate the limit.

$$\lim_{x \rightarrow 1} \arctan \left(\frac{x^2 - 1}{2x^2 - 2x} \right)$$

Answer: $\pi/4$

4. Find horizontal and vertical asymptotes of the graph of the function.

$$y = \frac{x - 9}{\sqrt{4x^2 + 3x + 2}}$$

Answer: Horizontal asymptotes are $y = \pm \frac{1}{2}$, and there is no vertical asymptotes

5. Find the equation of the tangent line to the curve

$$y = \sqrt{2x + 1}$$

at the point $(4, 3)$ by using the limit of the average rate of change.

Answer: $y = \frac{1}{3}x + \frac{5}{3}$