MATH 101
QUIZ 1A

Name: **Serial No.** **section:**

1. Find all horizontal asymptotes of the graph of $f(x) = \arctan\left(\dfrac{\sqrt{9x^2+2}}{3x+7}\right)$ and justify your answer.

2. Evalaute $\lim\limits_{x\to\infty}(\sqrt{x^2+x}-x)$

3. Evaluate the following limit

$$\lim_{h\to 0}\frac{e^{2x}(e^{2h}-1)}{3h}$$

4. The displacement (in meters) of a particle moving in a straight line is given by the equation of motion $S(t) = \dfrac{3t-1}{t+2}$ where t is measured in seconds. Use limits to find the instantaneous velocity at $t = 3$.

5. Find the equation of the tangent line to the curve $y = \sqrt{2x+1}$ at the point $(4, 3)$