9. [12 points] Determine if the following integrals converge or diverge. If the integral converges, circle the word "converges". If the integral diverges, circle "diverges". In either case, **you must show all your work and indicate any theorems you use**. You do not need to calculate the value of the integral if it converges.

a. [6 points] $\displaystyle\int_1^\infty \frac{2 + \sin x}{\sqrt{x} + 1}\, dx$

Converges   **Diverges**

b. [6 points] $\displaystyle\int_1^\infty \frac{\theta}{\sqrt{\theta^5 + 1}}\, d\theta$

Converges   **Diverges**