(1 point) Evaluate the integrals that converge, enter 'DNC' if integral Does Not Converge.

$$\int_0^{+\infty} \frac{1}{(x+2)\sqrt{x}}\, dx =$$ DNC

(1 point) Determine whether each of the following integrals is proper, improper and convergent, or improper and divergent.

? **1.** $\int_0^{19} \frac{1}{\sqrt[3]{x-9}}\, dx$

? **2.** $\int_{-\infty}^{\infty} \sin(5z)\, dz$

? **3.** $\int_{-\infty}^{\infty} \frac{t}{t^2+6}\, dt$

? **4.** $\int_{-6\pi}^{33\pi} \sin(\theta)\arctan(\theta)\, d\theta$

? **5.** $\int_9^{19} \ln(x-9)\, dx$

? **6.** $\int_{-\pi/9}^{19\pi/2} \tan^2(5x)\, dx$

? **7.** $\int_5^{\infty} \frac{1}{\sqrt{t^2-25}}\, dt$

? **8.** $\int_1^{\infty} se^{5s^2}\, ds$

(1 point) The improper integral $\int_{-\infty}^{\infty} x\, dx$ is

- **A.** divergent by comparison to $\int_{-\infty}^{\infty} xe^{-x}\, dx$.
- **B.** convergent since it equals $\lim_{t\to\infty} \int_{-t}^{t} x\, dx = \lim_{t\to\infty} \left(\frac{t^2}{2} - \frac{(-t)^2}{2}\right) = 0$.
- **C.** divergent since $\int_{-\infty}^{0} x\, dx$ is convergent and $\int_0^{\infty} x\, dx$ is divergent.
- **D.** divergent since both integrals $\int_{-\infty}^{0} x\, dx = -\infty$ and $\int_0^{\infty} x\, dx = +\infty$ are divergent.
- **E.** divergent by comparison to $\int_{-\infty}^{\infty} \sqrt{x}\, dx$.
- **F.** convergent since it equals $\lim_{a\to-\infty} \int_a^0 x\, dx + \lim_{b\to\infty} \int_0^b x\, dx = -\infty + \infty = 0$.
- **G.** convergent since the area to the left of $x = 0$ cancels with the area to the right of $x = 0$.

(1 point) Evaluate the integrals that converge, enter 'DNC' if integral Does Not Converge.

$$\int_8^{+\infty} \frac{3}{x^2-1}\, dx =$$ 3ln(63)/16