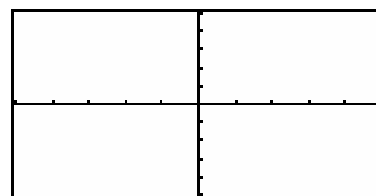**Assignment 16: Improper Integrals (6.6)**   Name_____
Please provide a handwritten response.

1a. The integrals $\int_{-1}^{1} \frac{1}{x} dx$ and $\int_{-1}^{1} \frac{1}{x^2} dx$ are both improper and divergent. Sketch

graphs of both $y = \frac{1}{x}$ and $y = \frac{1}{x^2}$ on the set of axes provided below. Be sure to label

which graph is which.

$-1 \le x \le 1, -100 \le y \le 100$

1b. To try to evaluate $\int_{-1}^{1} \frac{1}{x} dx$ on your calculator, use the **fnInt** command.

|	**TI-83 Plus/TI-84 Plus**	**TI-86**
COMPUTE A DEFINITE INTEGRAL	**MATH 9 fnInt(** The syntax is: (function,variable, low limit,high limit) This example is entered: **fnInt(1/x,x,-1,1)**	**2ND ÷ (CALC) F5 (fnInt)** The syntax is: (function,variable,low limit, high limit) This example is entered: **fnInt(1/x,x,-1,1)**

Record the result below. Does your calculator give you a value for this integral?

1c. Likewise evaluate $\int_{-1}^{1} \frac{1}{x^2}$ by executing **fnInt(1/x^2,x,-1,1)** and record the result

below.

1d. Does your calculator confirm that each of these integrals is divergent? Explain
carefully below why your calculator gives the results that it does.

2a. Sketch the graph of $f(x) = \dfrac{1}{\sqrt{1+\cos x}}$ over $0 \le x \le \pi$ on the axes provided below

and explain why the integral $\displaystyle\int_0^\pi \dfrac{1}{\sqrt{1+\cos x}}\,dx$ is improper.
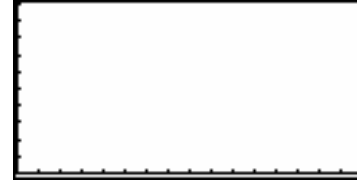
$$0 \le x \le \pi,\; 0 \le y \le 20$$

2b. Execute the command **fnInt(1/ (1+cos(x)),x,0,π)** and record the result below. Does this integral converge?

2c. Execute the command **fnInt(1/(1+cos(x))^.5,x,0, π)** and record the result below. Does this integral converge?

2d. Execute the command **fnInt(1/(1+cos(x))^(1/2),x,0, π)** and record the result below. Does this integral converge?