3. [9 points] For each of the questions on this page you must circle exactly *one choice* to receive any credit. No credit will be awarded for unclear markings and no justification is necessary.

a. [3 points] The functions shown below are continuous on the interval $(0, 2)$ and have a vertical asymptote at $x = 0$. The only point of intersection between the graphs of any of the functions is at $x = 1$, where all 5 graphs intersect.
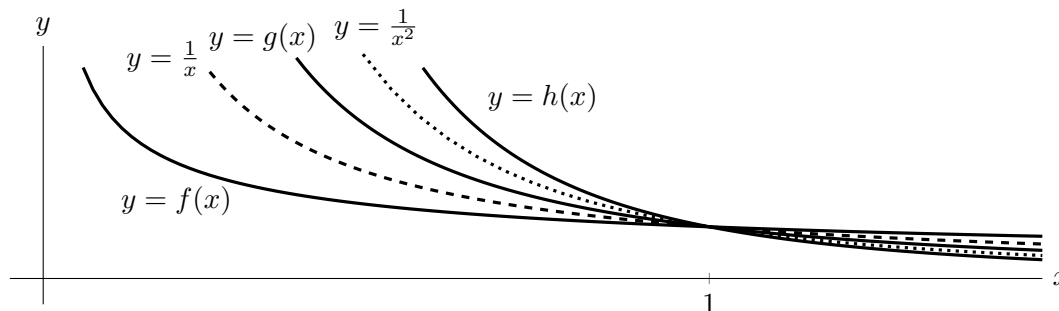
Determine whether the following integrals converge or diverge. If there is not enough information to determine convergence or divergence, circle "NOT ENOUGH INFO".

i. $\displaystyle\int_0^1 f(x)\, dx$ A. CONVERGES   B. DIVERGES   C. NOT ENOUGH INFO

ii. $\displaystyle\int_0^1 g(x)\, dx$ A. CONVERGES   B. DIVERGES   C. NOT ENOUGH INFO

iii. $\displaystyle\int_0^1 h(x)\, dx$ A. CONVERGES   B. DIVERGES   C. NOT ENOUGH INFO

b. [3 points] Suppose $g(x)$ is the probability density function for the height, in inches, of a certain population of people. Which of the following is the <u>one best</u> interpretation of the equation $g(60) = 0.4$?

A. About 40% of this population is exactly 60 inches tall.

B. About 40% of this population is at most 60 inches tall.

C. About 60% of this population is at most 60 inches tall.

D. About 40% of this population is between 60 and 60.4 inches tall.

E. About 20% of this population is between 60 and 60.5 inches tall.

F. About 60% of this population is between 60 and 61 inches tall.

c. [3 points] Consider the power series $\displaystyle\sum_{n=0}^{\infty} \frac{-1}{1 + 2n}\, x^n.$

For each of the values of x below, does the power series converge or diverge?

i.   At $x = 1$, the power series   A. CONVERGES   B. DIVERGES

ii. At $x = 0$, the power series   A. CONVERGES   B. DIVERGES

iii. At $x = -2$, the power series   A. CONVERGES   B. DIVERGES