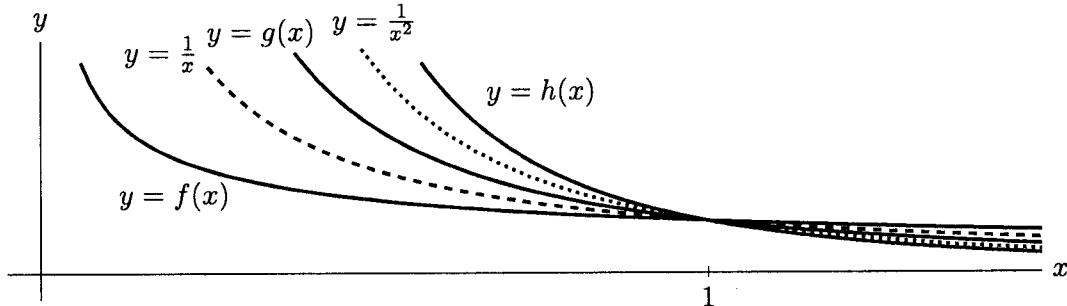


3. [9 points] For each of the questions on this page you must circle exactly *one choice* to receive any credit. No credit will be awarded for unclear markings and no justification is necessary.

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.

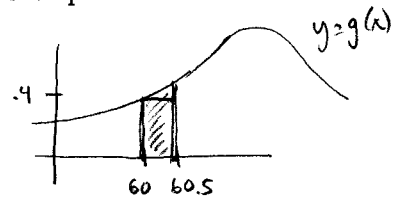


Determine whether the following integrals converge or diverge. If there is not enough information to determine convergence or divergence, circle "NOT ENOUGH INFO".

- i. $\int_0^1 f(x) dx$ A. CONVERGES B. DIVERGES **C. NOT ENOUGH INFO**
- ii. $\int_0^1 g(x) dx$ A. CONVERGES **B. DIVERGES** C. NOT ENOUGH INFO
- iii. $\int_0^1 h(x) dx$ 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 one best 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.



$$\begin{aligned}
 &P(60 \leq \text{height} \leq 60.5) \\
 &= \int_{60}^{60.5} g(x) dx \\
 &\approx \text{area of left rectangle} \\
 &= (.4)(.5) = .2
 \end{aligned}$$

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

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**