(1) The income distribution of Absurdistan is described by the function $f(x) = 0.4x^{1.5} + 0.6x^{3.5}$.
Find the Gini coefficient for the country.

(2) Equidistan's income distribution is described by the function $f(x) = \dfrac{e^{0.2x} - 1}{e^{0.2} - 1}$.
Find the Gini index for the country.

(3) The income distribution of Penguina is described by the function $f(x) = xe^{x^2 - 1}$.
Find the Gini coefficient for the country.

(4) A certain country's income distribution is described by the function $f(x) = \dfrac{15}{16}x^2 + \dfrac{1}{16}x$.

   (a) Sketch the Lorenz curve for this function.

   (b) Compute $f(0.4)$ and $f(0.9)$ and interpret your results.

(5) A certain country's income distribution is described by the function $f(x) = \dfrac{4}{5}x^2 + \dfrac{1}{5}x$.

   (a) Sketch the Lorenz curve for this function.

   (b) Compute $f(0.3)$ and $f(0.7)$ and interpret your results.

(6) In a study conducted by a certain country's Economic Development Board, it was found that the Lorenz curve for the distribution of income of college teachers was described by the function $f(x) = \dfrac{13}{14}x^2 + \dfrac{1}{14}x$ and that of lawyers by the function
$g(x) = \dfrac{9}{11}x^4 + \dfrac{2}{11}x.$

   (a) Compute the coefficient of inequality for each Lorenz curve.

   (b) Which profession has a more equitable income distribution?

(7) In a study conducted by a certain country's Economic Development Board, it was found that the Lorenz curve for the distribution of income of stock-brokers was described by the function $f(x) = \dfrac{11}{12}x^2 + \dfrac{1}{12}x$ and that of high school teachers by the function
$g(x) = \dfrac{5}{6}x^2 + \dfrac{1}{6}x.$

   (a) Compute the coefficient of inequality for each Lorenz curve.

   (b) Which profession has a more equitable income distribution?

ANSWERS:
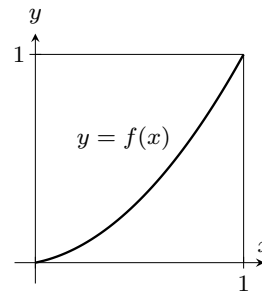
(1) 0.4133

(2) 0.0333

(3) $\dfrac{1}{e} \approx 0.3679$
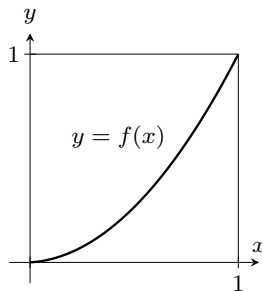
(4) (a)

   (b) $f(0.4) = 0.175$. The lowest 40% of the people receive 17.5% of the total income.

   $f(0.9) \approx 0.8156$. The lowest 90% of the people receive 81.56% of the total income.

(5) (a)

   (b) $f(0.3) = 0.132$. The lowest 30% of the people receive 13.2% of the total income.

   $f(0.7) = 0.532$. The lowest 70% of the people receive 53.2% of the total income.

(6) (a) 0.31; 0.491

   (b) College teachers

(7) (a) 0.306; 0.278

   (b) High school teachers