35. If f is an antiderivative of $\dfrac{\tan^2 x}{x^2+1}$ such that $f(1) = \dfrac{1}{2}$, then $f(0) =$
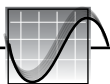
(A) 0.155   (B) 0.345   (C) 0.845   (D) 1

Answer

36. How many points of inflection does the graph of the function $f(x) = 0.25x^2 - e^{-x} - \cos(x) - x$ have on the interval $0 \le x \le 20$?

(A) Three   (B) Six   (C) Seven   (D) Ten

Answer

37. Let f be the function given by $f(x) = 5 + 5.8 \sin\left(\frac{\pi x}{4}\right) - 15.7 \cos\left(\frac{\pi x}{3}\right)$.

    For $0 \le x \le 12$, f is increasing most rapidly when x equals

    (A) 4.434   (B) 6.000   (C) 7.566   (D) 10.672

    Answer

38. The rate of the spread of a communicable viral infection among the population of Eulerville is modeled by $R(t) = 530e^{0.18t}$ persons per day. If there is no cure in sight and 725 people now have the viral infection, what is the projected number of people who will have the viral infection when $t = 6$ (six days from now)?

    (A) 2,286   (B) 5,726   (C) 6,451   (D) 7,287

    Answer
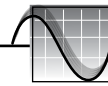
39. If f is a continuous odd function and the $\lim\limits_{x\to-\infty} f(x) = -3$, which of the following statements must be true?

      I. $\lim\limits_{x\to+\infty} f(x) = 3$.

      II. There are no vertical asymptotes.

      III. The lines $y = 3$ and $y = -3$ are horizontal asymptotes.

(A) I only

(B) II only

(C) I and III only

(D) I, II, and III

Answer

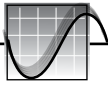40. Let $f(x) = x^3 - 7x^2 + 25x - 39$ and let g be the inverse function of f. What is the value of $g'(0)$?

(A) $-\dfrac{1}{25}$ (B) $\dfrac{1}{25}$ (C) $\dfrac{1}{10}$ (D) 10

Answer

41. If $k > 0$ and $\displaystyle\int_{k}^{6} \frac{dx}{x+2} = \ln k$, then $k =$

(A) 2   (B) 3   (C) 4   (D) 5

Answer

42. A rectangle inscribed in a semicircle of radius 8 has one side lying on the diameter of the circle. What is the maximum possible area of the rectangle?

(A) $8\sqrt{2}$ (B) 32   (C) $32\sqrt{2}$ (D) 64

Answer