10. $\int_1^{\infty} x^{-\frac{5}{4}} dx$ is

(A) 4 (B) $\frac{5}{4}$ (C) $\frac{1}{4}$ (D) -4 (E) divergent

Answer

11. A function f is continuous on the closed interval $[4,6]$ and twice differentiable on the open interval $(4,6)$. If $f'(5) = -3$, and f is concave downwards on the given interval, which of the following could be a table of values for f?

(A)

x	$f(x)$
4	8
5	4
6	0

(B)

x	$f(x)$
4	8
5	6
6	2

(C)

x	$f(x)$
4	8
5	6
6	5

(D)

x	$f(x)$
4	6
5	4
6	2

(E)

x	$f(x)$
4	8
5	3
6	2

Answer

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12. The equation of the line tangent to the curve $y = \dfrac{kx+8}{k+x}$ at $x = -2$ is $y = x + 4$. What is the value of k ?

(A) -3 (B) -1 (C) 1 (D) 3 (E) 4

Answer

x	5	6	9	11	12
$f(x)$	10	7	11	12	8

13. A function f is continuous on the closed interval $[5,12]$ and differentiable on the open interval $(5,12)$ and f has the values given in the table above. Using the subintervals $[5,6]$, $[6,9]$, $[9,11]$, and $[11,12]$, what is the right Riemann sum approximation to $\int_5^{12} f(x)\,dx$?

(A) 64 (B) 65 (C) 66 (D) 68.5 (E) 72

Answer

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14. $\sum_{k=0}^{\infty}\left(-\frac{\pi}{3}\right)^k$ is

(A) $\frac{1}{1-\frac{\pi}{3}}$ (B) $\frac{\frac{\pi}{3}}{1-\frac{\pi}{3}}$ (C) $\frac{1}{1+\frac{\pi}{3}}$ (D) $\frac{\frac{\pi}{3}}{1+\frac{\pi}{3}}$ (E) divergent

Answer

15. The following statements concerning the location of an extreme value of a twice-differentiable funtion, f, are all true. Which statement also includes the correct justification?

(A) The function has a maximum at $x = 5$ because $f'(5) = 0$.

(B) The function has a maximum at $x = 5$ because $f'(x) < 0$ for $x < 5$ and $f'(x) > 0$ for $x > 5$.

(C) The function has a minimum at $x = 3$ because the tangent line at $x = 3$ is horizontal.

(D) The function has a minimum at $x = 3$ because $f'(x) < 0$ for $x < 3$ and $f'(x) > 0$ for $x > 3$.

(E) The function has a minimum at $x = 3$ because $f''(3) < 0$.

Answer

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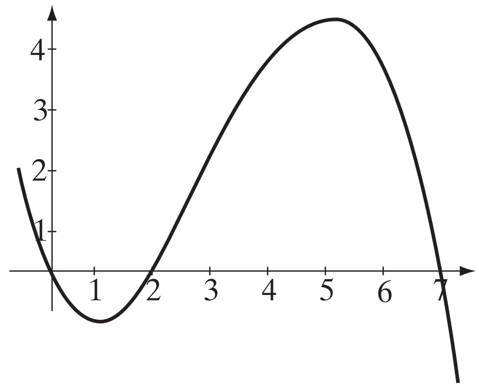

Graph of f

16. The graph of a differentiable function f is shown above. The graph has a relative minimum at $x = 1$ and a relative maximum at $x = 5$. Let g be the function defined by $g(x) = \int_0^x f(t)\,dt$. For what value of x does the graph of g change from concave up to concave down?

(A) 0 (B) 1 (C) 2 (D) 5 (E) 7

Answer

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