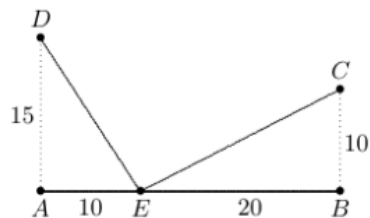


AP Calculus AB
Test

Name: _____
Friday, November 30, 2012

Instructions: Justify all answers. You MAY use a calculator on this test. If you have questions, please ask. Good luck and have fun-ctions!



1. In the diagram, AEB is straight and angles A and B are right. Calculate the total distance $DE + EC$.
2. If $AE = 20$ and $EB = 10$ instead, would $DE + EC$ be the same? Justify your response.
3. The value chosen for AE determines the value of $DE + EC$. You could also say that $DE + EC$ is a function of AE . Letting x stand for AE , write a formula for this function. Using calculus, find the value of x that produces the shortest path from D to C through E .

4. Calculate the derivative of each function.

a. $f(x) = \ln \sqrt[3]{\sin x}$

b. $x^3 - e^{xy} + y^4 = \pi$

c. $y = x^3 e^{\frac{1}{3}} - e^x$

d. $f(x) = \sin(\ln(\sqrt{x}))$

5. Given that $f(x) = 4 + \frac{3}{x}$ find all values of c in the interval $(1,3)$ that satisfy the Mean Value Theorem.

6. Write the equation of the tangent line to $f(x) = xe^{-x}$ at the point of inflection.