

Online Homework System

Assignment Worksheet
10/9/13 - 1:34 PM

Name: _____

Class: _____

Class #: _____

Section #: _____

Instructor: Karl Kristian Brustad

Assignment: Transcendental/More applications

Question 1: (1 point)

Solve the equation

$$\frac{x}{34} = \cos\left(\arctan\left(\frac{16}{x}\right)\right), \quad x > 0.$$

Your answer should be an exact number.

Hint: Draw a right angled triangle where the shortest sides have lengths x and 16, respectively.

Question 2: (1 point)What is $y'(2)$ if

$$y(x) = \arcsin(mx + k),$$

 $m > 0$ and the domain of y is $D(y) = [0, 4]$?Your answer should be an exact number.

Question 3: (1 point)

Find an equation of the tangent line to the curve

$$\arctan \frac{8x}{y} = 16\pi \frac{x}{y^2}$$

at the point $(x, y) = (1, 8)$.What is the y -coordinate to the tangent line at $x = \pi$?Your answer should be an exact number. Write π as Pi.

Question 4: (1 point)

Let f and g be the functions

$$f(x) = \sinh(2 \ln x), \quad g(x) = (x^2 - 1)(x^2 + 1).$$

Find a function h such that

$$f(x) = h(x)g(x), \quad \forall x \in (0, \infty).$$

Your answer should be an expression in x .

Use the preview function to check if your answer looks ok.

Question 5: (1 point)

Find the rate of change of the area of a square whose sides are 10 cm long, if the side length is increasing at 2 cm/min.

Pose your answer in cm^2/min .

Question 6: (1 point)

At a certain instant the length of a rectangle is 21 m and the width is 3 m. The width is increasing at 2 m/s. How fast is the length decreasing if the area of the rectangle is not changing?

Your answer should be a positive number given in m/s.

Question 7: (1 point)

The top of a 5 m long ladder rests against a vertical wall. If the base of the ladder is being pulled away from the base of the wall at a rate of 0.2 m/s, how fast is the top of the ladder slipping down the wall when it is 3 m above the base of the wall? Your answer should be a positive number given in m/s.

Question 8: (1 point)

We want to solve the equation

$$2x = e^{-x}$$

by using Fixed-point iteration on the function $f(x) = \frac{e^{-x}}{2}$.

If we start with $x_0 = 0.38$, what is x_2 ?

Pose your answer rounded to five decimals.

Tips for Citizen calculator:

Dial in the numerical value of x_0 .

Press =

Dial in $e^{-Ans}/2$

Press = to get x_1
Press = again to get x_2 , etc.

Question 9: (1 point)

Use Newton's method to find the smallest root of

$$p(x) = x^4 - 8x^2 - x + 13$$

in $[1, 3]$.
Round your answer to 7 decimals.

Tips for Citizen calculator:
Dial in the numerical value of x_0 .
Press =
Dial in $Ans - p(Ans)/p'(Ans)$
Press = to get x_1
Press = again to get x_2 , etc.
