Web**Assign**

Hw 12 (14.4): Tangent Planes and Linear Approx. (Homework)

Yinglai Wang
MA 261 Fall 2012, section 121, Fall 2012
Instructor: David Daniels

Current Score : 20 / 20   **Due :** Tuesday, September 18 2012 11:00 PM EDT

The due date for this assignment is past. Your work can be viewed below, but no changes can be made.

Important! Before you view the answer key, decide whether or not you plan to request an extension. Your Instructor may *not* grant you an extension if you have viewed the answer key. Automatic extensions are not granted if you have viewed the answer key.

View Key

---

1. 2.85/2.85 points | Previous Answers   SCalcET7 14.4.002.MI.

Find an equation of the tangent plane to the given surface at the specified point.

$$z = 6(x - 1)^2 + 5(y + 3)^2 + 6, \quad (2, -2, 17)$$

✔

Need Help? [Read It] [Master It] [Chat About It]

---

2. 2.85/2.85 points | Previous Answers   SCalcET7 14.4.006.

Find an equation of the tangent plane to the given surface at the specified point.

$$z = \ln(x - 4y), \quad (5, 1, 0)$$

[Get ADOBE® FLASH® PLAYER]

Flash Player version 10 or higher is required for this question.
You can get Flash Player free from Adobe's website.

✔

Need Help? [Read It] [Chat About It]

---

3. 2.85/2.85 points | Previous Answers   SCalcET7 14.4.021.

Find the linear approximation of the function $f(x, y, z) = \sqrt{x^2 + y^2 + z^2}$ at $(3, 6, 6)$ and use it to approximate the number $\sqrt{3.03^2 + 5.98^2 + 5.99^2}$. (Round your answer to five decimal places.)

$f(3.03, 5.98, 5.99) \approx$ [8.99] ✔

Need Help? [Read It] [Watch It] [Chat About It]

- -

4. 2.85/2.85 points | [Previous Answers](#)   SCalcET7 14.4.022.

The wave heights h in the open sea depend on the speed v of the wind and the length of time t that the wind has been blowing at that speed. Values of the function $h = f(v, t)$ are recorded in feet in the following table.

v \ t	5	10	15	20	30	40	50
20	5	7	8	8	9	9	9
30	9	13	16	17	18	19	19
40	14	21	25	28	31	33	33
50	19	29	36	40	45	48	50
60	24	37	47	54	62	67	69

Duration (hours) across the top; *Wind speed (knots)* down the side.

Use the table to find a linear approximation to the wave height function when v is near 40 knots and t is near 20 hours. (Round your numerical coefficients to two decimal places.)

$f(v, t) \approx$

Flash Player version 10 or higher is required for this question.
You can [get Flash Player free from Adobe's website](#).

✔

Estimate the wave heights when the wind has been blowing for 22 hours at 41 knots. (Round your answer to two decimal places.)

30.05 ✔   ft

Need Help?   [Read It]   [Chat About It]

---

5. 2.85/2.85 points | Previous Answers   SCalcET7 14.4.025.

Find the differential of the function.

$$z = e^{-7x} \cos 9\pi t$$

$dz =$

✔ $dx +$

✔ dt

Need Help? [Read It] [Chat About It]

---

6. 2.85/2.85 points | Previous Answers   SCalcET7 14.4.028.

Find the differential of the function.

$$T = \frac{v}{1 + uvw}$$

$dT =$

✔ $du +$ ✔ $dv +$ ✔ dw

Need Help? [Read It] [Chat About It]

---

7. 2.9/2.9 points | Previous Answers   SCalcET7 14.4.031.

If $z = 7x^2 + y^2$ and (x, y) changes from $(1, 2)$ to $(0.95, 2.1)$, compare the values of Δz and dz. (Round your answers to four decimal places.)

$dz = $ -0.3 ✔

$\Delta z = $ -0.2725 ✔

Need Help?   [Read It]   [Watch It]   [Chat About It]

If $z = 7x^2 + y^2$ and (x, y) changes from $(1, 2)$ to $(0.95, 2.1)$, compare the values of Δz and dz.