

WebAssign**Hw 13 (14.4-5): Linear Approx.; Chain Rule (Homework)**

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MA 261 Fall 2012, section 121, Fall 2012

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Current Score : 20 / 20**Due :** Thursday, September 20 2012 11:00 PM EDT**1.** 2.22/2.22 points | [Previous Answers](#)

SCalcET7 14.4.033.MI.

The length and width of a rectangle are measured as 33 cm and 46 cm, respectively, with an error in measurement of at most 0.1 cm in each. Use differentials to estimate the maximum error in the calculated area of the rectangle.

  cm²**Need Help?**[Read It](#)[Master It](#)[Chat About It](#)**2.** 2.22/2.22 points | [Previous Answers](#)

SCalcET7 14.4.035.

Use differentials to estimate the amount of tin in a closed tin can with diameter 12 cm and height 12 cm if the tin is 0.04 cm thick. (Round your answer to two decimal places.)

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SCalcET7 14.5.001.

Use the Chain Rule to find dz/dt .

$$z = x^2 + y^2 + xy, \quad x = \sin t, \quad y = 8e^t$$

$$\frac{dz}{dt} =$$

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4. 2.22/2.22 points | [Previous Answers](#)

SCalcET7 14.5.003.

Use the Chain Rule to find dz/dt .

$$z = \sqrt{4 + x^2 + y^2}, \quad x = 6 \ln t, \quad y = \cos t$$

$$\frac{dz}{dt} =$$



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5. 2.22/2.22 points | [Previous Answers](#)

SCalcET7 14.5.007.

Use the Chain Rule to find $\partial z/\partial s$ and $\partial z/\partial t$.

$$z = x^9 y^7, \quad x = s \cos t, \quad y = s \sin t$$

$$\frac{\partial z}{\partial s} =$$



$$\frac{\partial z}{\partial t} =$$



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6. 2.22/2.22 points | [Previous Answers](#)

SCalcET7 14.5.013.

If $z = f(x, y)$, where f is differentiable, and

$$x = g(t) \quad y = h(t)$$

$$g(9) = 7 \quad h(9) = 0$$

$$g'(9) = -3 \quad h'(9) = -8$$

$$f_x(7, 0) = -3 \quad f_y(7, 0) = -5$$

find dz/dt when $t = 9$.

$$\frac{dz}{dt} = \boxed{49} \quad \checkmark$$

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7. 2.22/2.22 points | [Previous Answers](#)

SCalcET7 14.5.015.

Suppose f is a differentiable function of x and y , and $g(u, v) = f(e^u + \sin v, e^u + \cos v)$. Use the table of values to calculate $g_u(0, 0)$ and $g_v(0, 0)$.

	f	g	f_x	f_y
$(0, 0)$	0	8	3	7
$(1, 2)$	8	0	1	2

$$g_u(0, 0) = \boxed{3} \quad \checkmark$$

$$g_v(0, 0) = \boxed{1} \quad \checkmark$$

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8. 2.22/2.22 points | [Previous Answers](#)

SCalcET7 14.5.021.

Use the Chain Rule to find the indicated partial derivatives.

$$z = x^4 + x^2y, \quad x = s + 2t - u, \quad y = stu^2;$$

$$\frac{\partial z}{\partial s}, \frac{\partial z}{\partial t}, \frac{\partial z}{\partial u} \quad \text{when } s = 1, t = 4, u = 5$$

$$\frac{\partial z}{\partial s} = \boxed{2656} \quad \checkmark$$

$$\frac{\partial z}{\partial t} = \boxed{2512} \quad \checkmark$$

$$\frac{\partial z}{\partial u} = \boxed{-416} \quad \checkmark$$

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9. 2.24/2.24 points | [Previous Answers](#)

SCalcET7 14.5.025.

Use the Chain Rule to find the indicated partial derivatives.

$$N = \frac{p+q}{p+r}, \quad p = u + vw, \quad q = v + uw, \quad r = w + uv;$$

$$\frac{\partial N}{\partial u}, \frac{\partial N}{\partial v}, \frac{\partial N}{\partial w} \quad \text{when } u = 6, v = 7, w = 3$$

$$\frac{\partial N}{\partial u} = \boxed{-128/5184} \quad \checkmark$$

$$\frac{\partial N}{\partial v} = \boxed{-180/5184} \quad \checkmark$$

$$\frac{\partial N}{\partial w} = \boxed{520/5184} \quad \checkmark$$

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