Calculus Worksheet: Differentiation of Functions (1)

1. Which of the following is the derivative, *dzdt*, written in terms of *t* where *z*=*x*2*y*+*y*2*x* where *x*=cos*t* and *y*=*t*2?

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| Answer: | *dzdt*=−2*t*2cos*t*sin*t*−*t*4sin*t*+2*t*cos2*t*+4*t*3cos*t* |

1. Suppose *z*=ln*xy* where *x*=*t*√ and *y*=*t*2. Use the chain rule to determine which of the following is *dzdt*.

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| Answer: | *dzdt*=32*t* |

1. Find the derivative of F(x) if http://archives.math.utk.edu/visual.calculus/2/chain_rule.4/eq1.gif.

Answer: 21[(x^3+5x)^6](3x+5)

1. Suppose *z*=2*xy* where *x*=*t*2+1 and *y*=3−*t*. Use the chain rule to determine dz/dt.

Answer: *dzdt*=12*t*−6*t*2−2

1. Suppose *z*=*xy*−2*y*2 where *x*=3*t*+1 and *y*=2*t*. Use the chain rule to determine which of the following is *dzdt*.

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| Answer: |  | *dzdt*=−4*t*+2 |
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("The university ofsydney," 2010)