# MATH 161 Solutions: quiz vI 12 October 2018

1. Find an anti-derivative of each of the following functions:

***Solution:***

A good first guess might be

Correcting for constants the answer is

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***Solution: First note that***

Thus an antiderivative that we seek is

1. *[1 pt]* Which of the graphs below is that of



Answer: **D**



1. *[1 pt]* Given the graphs of the functions f(x) and g(x) in figures 3.7 and 3.8, which of the following (a) – (d) is a graph of



*Answer:* ***C***

*Reason: Because (f(g(x)))′ = f ′ (g(x))g ′ (x), we see f(g(x)) has a horizontal tangent whenever g′(x) = 0*

*or f ′(g(x)) = 0. Now, f ′(g(x)) = 0 for 1 < g(x) < 2 and this approximately corresponds to 1.7 < x <2.5.*

1. Using the chain rule compute the derivative of each of the following functions. You need not simplify.
2.

***Solution: Using the chain rule (shortcut):***

1.

***Solution:***

***Using the chain rule (shortcut):***

***Solution: Using the general power rule:***

1.

***Solution: First using the product rule:***

***Extra Credit:***

Consider the piecewise linear function f(x) graphed below:



For each function g(x) find the value of

***Solution:***  Using the chain rule:

Now: Since the slope of the curve at x=3 is , the equation of the curve in the vicinity of x = 3 is

f(x) = -1(x) + 10.

So f(3) = 7

**Solution:** Using the quotient rule,

Invoking the chain rule to compute

And so

Since f(9) = -3 and



*O dear Ophelia!*

*I am ill at these numbers:*

*I have not art to reckon my groans*.

- HAMLET (Act II, Sc. 2)

