# MATH 161 Solutions: quiz v

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*Problems 1 – 3 are worth 1 pt each*

 *Hint: It may be helpful to think about*



Solution: **(c)**

Because

Now





*Solution:* **(a)**

Because

Now



*Solution:* **(c)**

Because

This happens when x = 0, 2, and 4. Also, f(g(x)) is negative for x > 4. Alternatively f(g(4)) = f(0) = 0 identifies answer (c).

4. *[3 pts each]* Find an anti-derivative of each of the following:

(a) 1 + 3x2 – 9x5

*Answer:*

1. 3 sin (5x)

*Answer:*

1. 1 +3ex + 4 cos x

*Answer:* + 4 sin x

1.

*Answer:*

*Answer:*

1. 1 + sec2 x

*Answer:*

5. *[5 pts]* Find any and all critical points of the function

*Solution:*

Hence the critical points are **x = -3/2** and **x = 3/2.**

6. *[5 pt each]*  Using implicit differentiation, find the equation of the *tangent line* to the curve y4 + xy = 4 at the point P = (3, 1)

*Solution: d/dx (LHS) = d/dx (RHS)*

Substituting x = 3 and y = 2:

Hence dy/dx = -1/7 and the tangent line is:

y – 1 = - (1/7) (x – 3)

7. *[3 pts each]* Find the derivative of each of the following functions. *You need not simplify.*

1.

*Solution:*

=

==

1. y = arctan(1+e2x)

*Solution:*

*Solution:*

1. y = sec(1 + 3ln x)

*Solution:*



