**MATH 162 Practice QUIZ VIII**

1. Give the correct *form* (for example: A/(x+2) + B/(x –13)) for the partial fraction decomposition of the following rational functions. *Do not solve for A, B, C, …*



1. Integrate each of the following functions:

















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4. The following is the graph of the spiral of Archimedes,

*r = ,* *0 ≤  ≤ 2*

Find the *area* of the region bounded by this curve and the positive x-axis.



1. Convert each polar equation to a Cartesian equation:
2. r2 = 4r cos 



1. Convert the given Cartesian equation to a polar equation:
2. x2 – y2 = 1
3. x + 2y = 2013
4. Find the arc length of the cardioid r = 1 + cos .
5. Find the area of the region bounded by the curve r = e and the rays

 = /6,  =  /3.

1. Find the area of the region enclosed by the curves r = 1, r = 2 sin .
2. Show that each function given below is a solution to the corresponding differential equation:







1. Match each of the following differential equations with its corresponding direction field.

(a) dy/dx = y

(b) dy/dx = 2(y – 4)

(c) dy/dx = y(x + y)

(d) dy/dx = y2

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| --- | --- |
| ***I*** | ***II*** |
| ***III*** | ***IV*** |

1. Using the change of variable v = y/x, solve the differential equation



1. Using the substitution v = y/x, solve the differential equation



1. Solve the following separable equations:







1. Solve the following initial value problems:







1. Solve each of the following first-order linear equations:







1. Verify that y1(t) = 1 and y2(t) = t1/2 are solutions of the second-order linear differential equation:



1. Verify that y1(x) = x and y2(x) = xex are solutions of the second-order linear differential equation:



1. For which value(s) of *r* is y = erx a solution of the linear differential equation



*I'm very good at integral and differential calculus,*

*I know the scientific names of beings animalculous;*

*In short, in matters vegetable, animal, and mineral,*

*I am the very model of a modern Major-General.*

*About binomial theorems I'm teeming with a lot of news,*

*With many cheerful facts about the square on the hypotenuse.*

- W. S. Gilbert, **The Pirates of Penzance**(1879)