

*4.1. Chain Rule*

Section 4.1 Exercises, pg. 160  
1, 3, 5, 7, 13, 16, 23, 24, 51, 67

*4.1. Numerical Values*

Section 4.1 Exercises, pg. 160  
56(c,d,e), 58(d,e)

*4.2. Implicit Differentiation*

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*4.2. Implicit Differentiation – II*

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Supplemental Problems:  
**1**

*4.3. Inverse Function Theorem*

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29(b,c)

Supplemental Problems:  
**2**

**Supplementary Problems:**

**1)** For  $y = y(x)$  given implicitly by

$$x^2y - xy^2 = 4 :$$

- a)** Solve the implicit equation for  $y$  in terms of  $x$  using the Quadratic Formula.
- b)** Graph  $y = y(x)$  from part **a** on the grid provided.
- c)** Look at  $x \rightarrow \pm\infty$  in the explicit equation from part **a** to find the horizontal asymptote and oblique asymptote. Also, what is the equation of the vertical asymptote? Graph the three asymptotes on the grid provided.
- d)** Calculate  $\frac{dy}{dx}$  implicitly.
- e)** From the result of part **d**, calculate the coordinates of the point where the tangent line of  $y = y(x)$  is horizontal. Graph this point on the grid provided.
- f)** From the result of part **d**, calculate the coordinates of the point where the tangent line of  $y = y(x)$  is vertical. Graph this point on the grid provided.
- g)** From the graph and parts **e** and **f**, state the domain and range of  $y = y(x)$ .

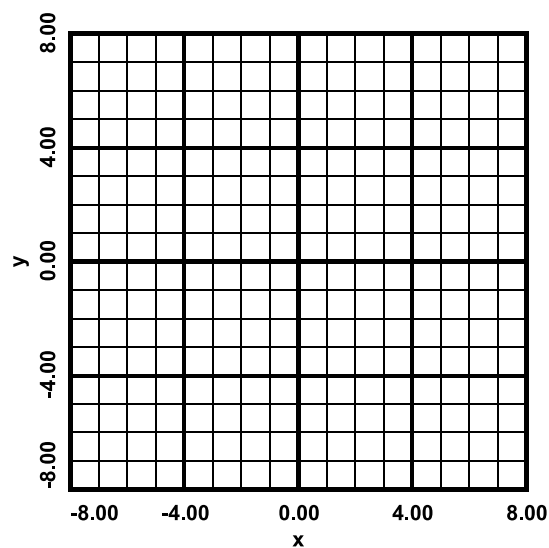
**2)** For

$$f(x) = \frac{1}{3}x^3 - \frac{33}{8}x^2 + \frac{85}{6}x - \frac{67}{8} :$$

- a)** Graph  $y = f(x)$  on the grid provided. Also, by switching  $x$  and  $y$ , graph  $y = f^{-1}(x)$  on the grid.
- b)** Calculate the equation of the line tangent to  $y = f^{-1}(x)$  at  $(1,5)$ . Graph the tangent line.
- c)** Calculate the equation of the line normal to  $y = f^{-1}(x)$  at  $(1,5)$ . Graph the normal line.

**Grids:**

1)



2)

