BC CALCULUS PRACTICE 9-10A R **Name:** ______________________________ **Period** ________

Aisle __________

Ch 9: pg. 622; 5, 7, 11, 15, 21, 23, 27 and
Ch 10: pg. 714; 11, 13
Show all necessary work neatly.

pg. 622

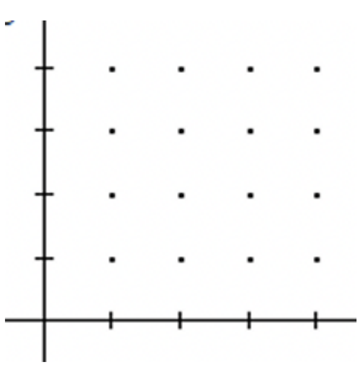
5.
Determine whether the methods of integrating factors and separation of variables produce the same solution of the differential equation
$$\frac{dy}{dx} - 4xy = x$$

7. Solve the differential equation either by the method of integrating factors or by separation of variables.
$$\frac{dy}{dx} = (1+y^2)x^2$$

11. Solve the initial value problem.
$$y' - xy = x; y(0) = 3$$

15. Solve the initial value problem.
$$y' = \frac{y^5}{x(1+y^4)}; y(1) = 1$$

21. Sketch the slope field for $y' = \frac{xy}{8}$ at the 25 gridpoints (x, y), where $x = 0,1,\ldots,4$ and $y = 0,1,\ldots,4$.



23. Approximate the solution of the initial value problem using Euler's method. Present your answer as a table.
$$\frac{dy}{dx} = \sqrt{y}; y(0) = 1, 0 \le x \le 4; \Delta x = 0.5$$

27. In each part, find the exponential growth model $y = y_0 e^{kt}$ that satisfies the given conditions.

(a) $y_0 = 2$, doubling time $T = 5$.

(b) $y(0) = 5$, growth rate 1.5%.

(c) $y(1) = 1; y(10) = 100$

(d) $y(1) = 1$; doubling time $T = 5$.

pg. 714

11. Find the general term of the sequence, starting with $n = 1$, determine whether the sequence converges, and if so find its limit.

(a)

$$\frac{3}{2^2 - 1^2}, \frac{4}{3^2 - 2^2}, \frac{5}{4^2 - 3^2}, \dots$$

(a)

$$\frac{1}{3}, -\frac{2}{5}, \frac{3}{7}, -\frac{4}{9}, \dots$$

13. Show that the sequence is eventually strictly monotone.

(a) $\{(n-10)^4\}_{n=0}^{\infty}$

(b) $\left\{\frac{100^n}{(2n)!n!}\right\}_{n=1}^{\infty}$