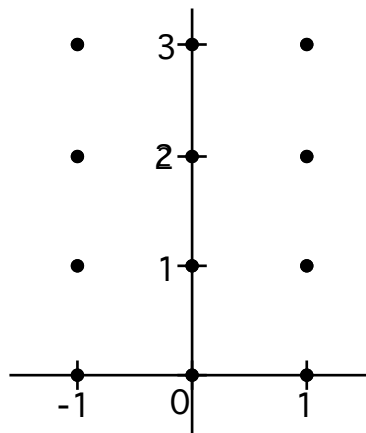# CH.6 Differential Equations / Slope Fields WS

Name_____ Per._____

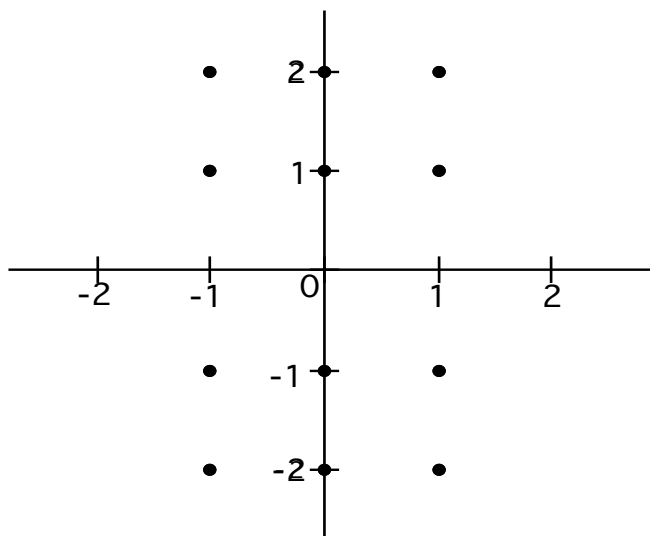1) Given the differential equation $\dfrac{dy}{dx} = x(y-3)$.

a) Sketch a slope field for the given differential equation at the twelve points indicated.

b) Find the particular solution $y = f(x)$ to the given differential equation with the initial condition $f(0) = 10$.

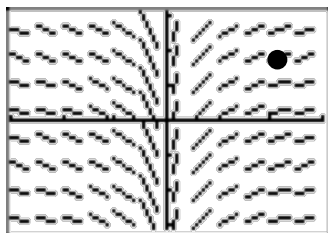2) Given the differential equation $\dfrac{dy}{dx} = \dfrac{x^3}{y}$.

a) Sketch a slope field for the given differential equation at the twelve points indicated.

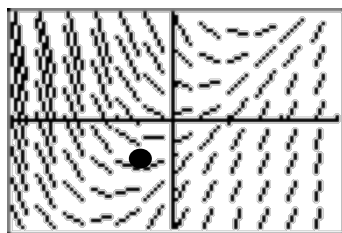b) Find the particular solution $y = f(x)$ to the given differential equation with the initial condition $f(2) = 6$.

3a) Given $\dfrac{dy}{dx} = \dfrac{1}{x}$

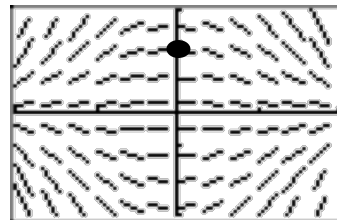Sketch the solution curve through the point $(3,3)$.

b) Given $\dfrac{dy}{dx} = 2x - y$

Sketch the solution curve through the point $(-1,-1)$.

c) Given $\dfrac{dy}{dx} = -xy$

Sketch the solution curve through the point $(0,2)$.

Find the particular solution $y = f(x)$

4) $y(x^3+1)y' = x^2 \qquad y(0) = -4$

5) $\dfrac{dy}{dx} = (2x+3)(y-4) \qquad y(5) = 3$

6) Bacteria, which has a double-life of 12 days, grows from its initial amount to a population of 4539 in 40 days. What was the initial amount?

7) The half-life of kryptonite is 1200 years. Our ancestors buried the kryptonite many years ago and when we dig up the kryptonite there is 10% as much as when it was buried. How old is the kryptonite?

8) If you are a lifer at Stinky Burger and made $9.00/hr. in 2004 and get a raise to $10.00/hr. in 2006 due to being named Captain Stinky (nobody embodies the essence of Stinky like you do),

a) What is the rate of increase? $\left(A = Pe^{rt}\right)$

b) What will your pay be in 2017 at this rate of growth?