Name _____

Slope Fields Worksheet #1

Slope fields provide a way for interpreting graphically the solutions of first-order differential equations. The procedure involves looking at the differential equation as a statement about the slope of portions of the graph depending on the point (x, y) in question. We first choose an arbitrary point and use the D.E. to calculate the slope. Then, we sketch a dash at the point we choose that has a slope equal to the value we just calculated.

Problem #1: Complete the table and sketch the slope field for the [-6, 6] x [-6, 6] integer grid for the given differential equation.

$$\frac{dy}{dx} = -\frac{x}{y}$$

x	y	m		x	y	m
2	1	-2				
0	1	0				
1	1	-1				

Problems 2-7: Sketch the slope field for the [-6, 6] x [-6, 6] integer grid for the given D.E.

#2: $\frac{dy}{dx} = 2x$

#3: $\frac{dy}{dx} = x + y$

#4: $\frac{dy}{dx} = y$

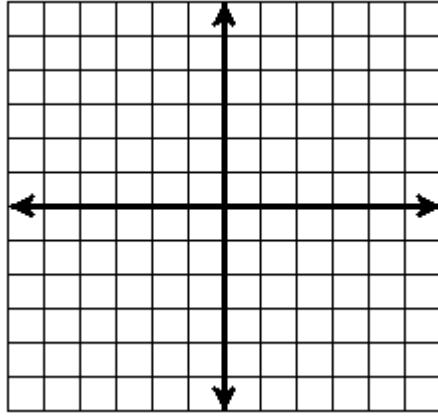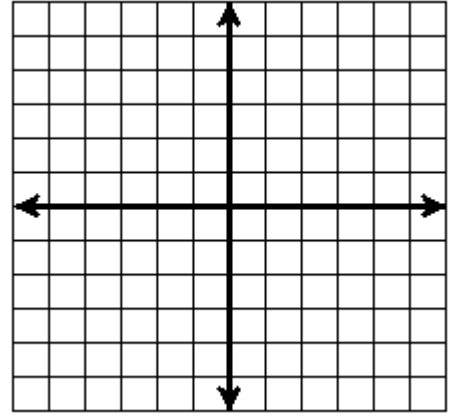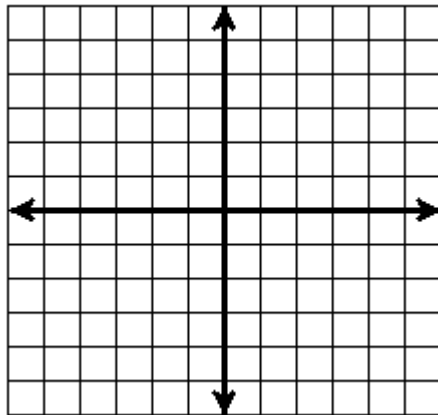**#5:** $\frac{dy}{dx} = x - y$

#6: $\dfrac{dy}{dx} = -xy$

#7: $\dfrac{dy}{dx} = \dfrac{2x}{y}$

#8: $\dfrac{dy}{dx} = y(4-y)$

#9: Go back and organize your slope fields into three groups: {#2}, {#4, 8}, {#3, 5, 6, 7}. Compare these groups. For example, what do graphs in the same group have in common? How are the groups different from each other? Would you expect these things to be true just by looking at the differential equation? Explain how you know.

#10: Your friend claims that solutions to $\dfrac{dy}{dx} = \dfrac{6-y}{x}$ will have a horizontal asymptote. Do you

agree? Without solving the equation, explain how you know.