Stony Brook University.
MAT 127 — Calculus C, Spring 12.
Examples for section 7.2

Here we give several examples of direction fields. Students are encouraged to work out this examples on their own and compare their solutions with the computer generated ones presented here.

In the picture below, we used arrows instead of straight lines (as done in class) simply to indicate the direction in which the variable (x, or t etc) increases.

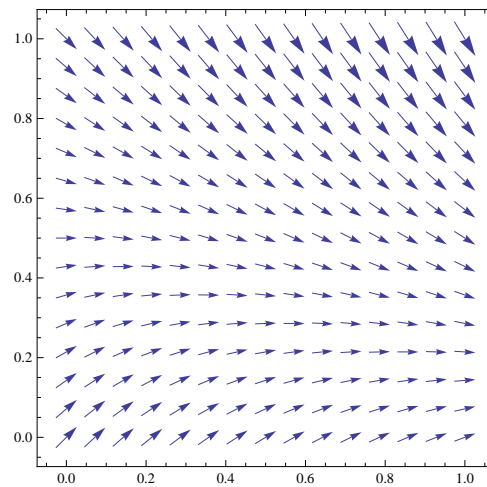
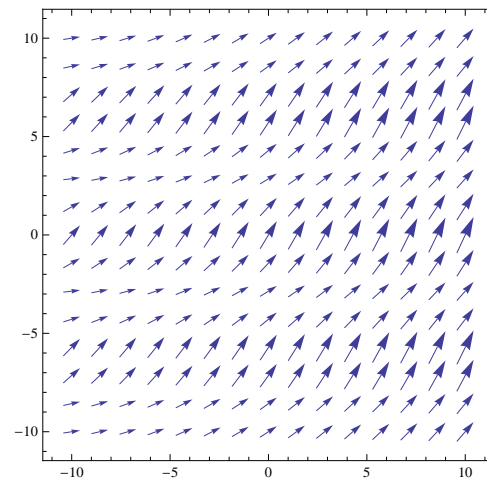FIGURE 1. Direction field for the differential equation $y' = e^{-x} + y$.

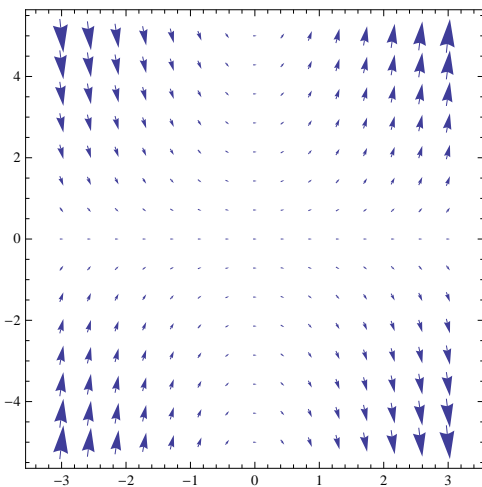FIGURE 2. Direction field for the differential equation $y' = \frac{1}{20}x + e^{\frac{1}{2}\cos y}$.

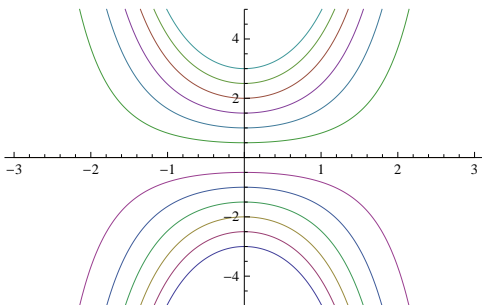FIGURE 3. Direction field for the differential equation $y' = xy$.

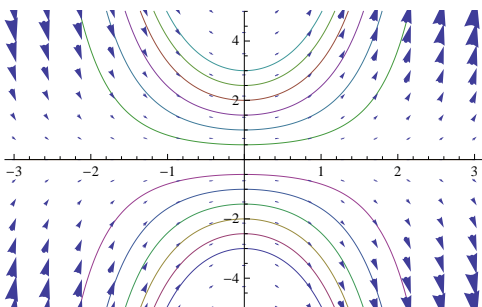FIGURE 4. Solution curves for the differential equation $y' = xy$.

FIGURE 5. Direction field *and* solution curves for the differential equation $y' = xy$. Notice how the curves are tangent to the direction field.
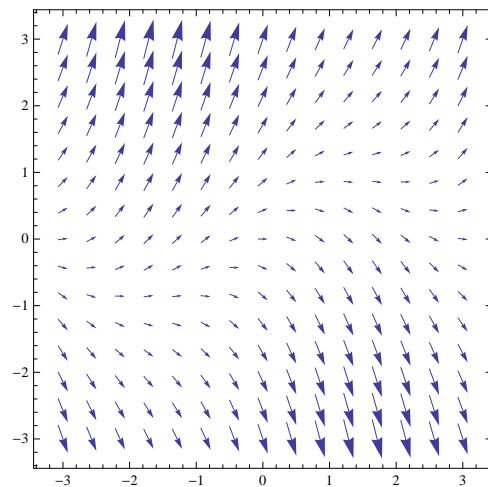
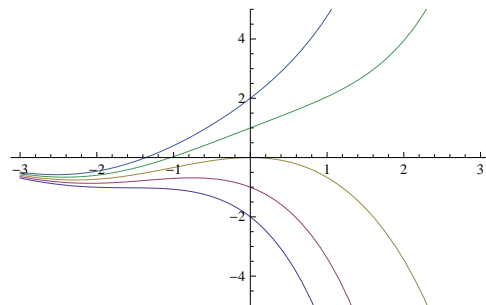FIGURE 6. Direction field for the differential equation $y' = y - \sin x$.

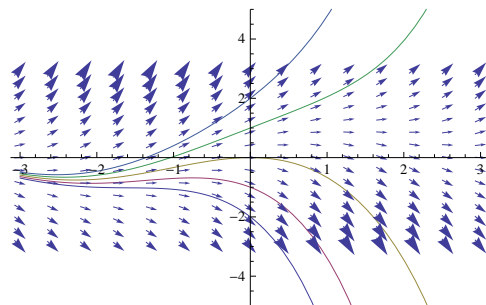FIGURE 7. Solution curves for the differential equation $y' = y - \sin x$.

FIGURE 8. Direction field *and* solution curves for the differential equation $y' = y - \sin x$. Notice how the curves are tangent to the direction field.
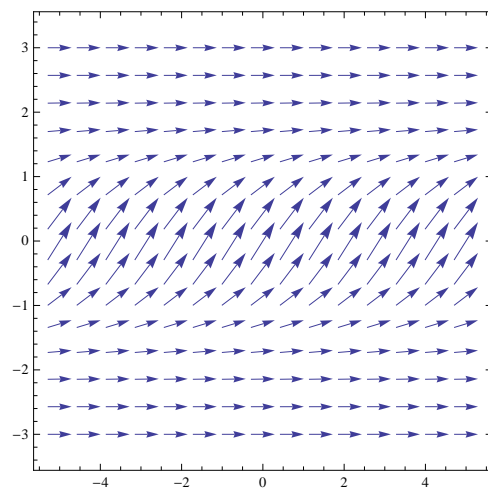
FIGURE 9. Direction field for the differential equation $y' = e^{-y^2}$ (this example was done in class).