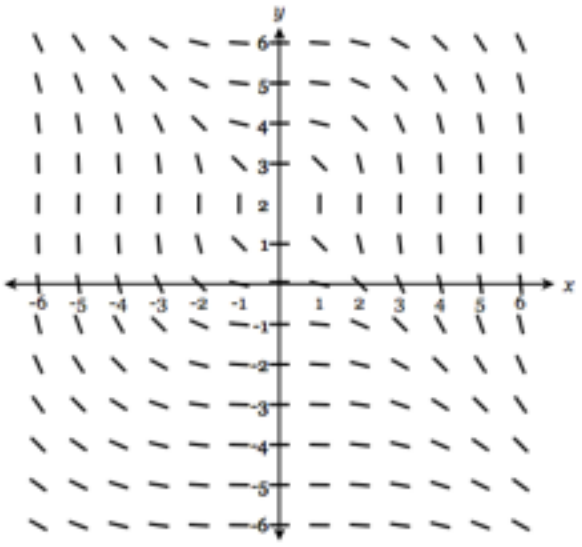
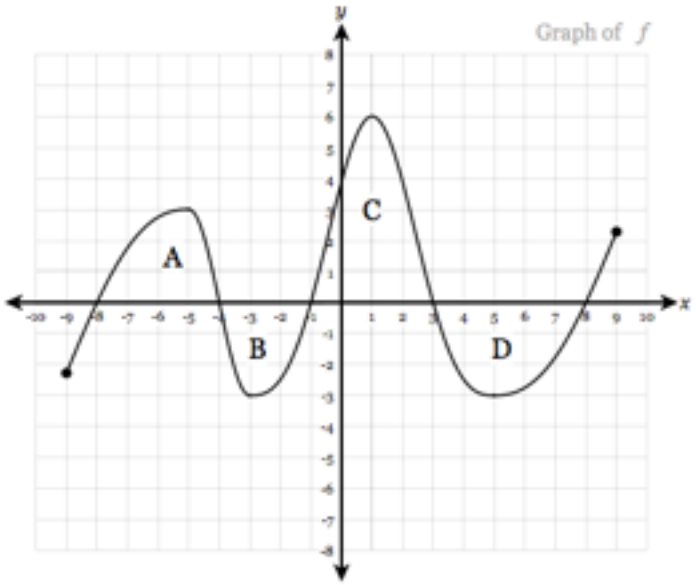
1. Consider the differential equation $\frac{dy}{dx} = \frac{(3y+1)^2}{x}$ with a particular solution $y = f(x)$ having an initial condition $y(1) = 0$. Use the equation of the line tangent to the graph of f at the point $(1, 0)$ in order to approximate the value of $f(1.2)$.

2. Select the differential equation that matches the given slope field.



- $\frac{dy}{dx} = -\frac{x^2}{y-2}$
- $\frac{dy}{dx} = -\frac{x^2}{(y-2)^2}$
- $\frac{dy}{dx} = \frac{x}{y-2}$
- $\frac{dy}{dx} = x^2(y-2)^2$

3. The regions A, B, C, and D in the figure below are bounded by the graph of the function f and the x-axis. The area of region A is 8, the area of region B is 6, the area of region C is 14, and the area of region D is 10. What is the average value of f on the interval $[-4, 8]$ in simplest form?



4. The regions A, B, C, D, and E in the figure below are bounded by the graph of the function f and the x-axis. The area of region A is 8, the area of region B is 4, the area of region C is 9, the area of region D is 14, and the area of region E is 16. What is the value of $\int_{-8}^{0} f(x)\,dx$?