Differential Equations Review Name:_____

1.	If $\frac{dy}{dx} = \frac{7x^2}{y^3}$ and $y(3) = 2$, find an equation for y in terms of x.
2.	If $\frac{dy}{dx} = 5x^2 y$ and $y(0) = 6$, find an equation for y in terms of x.
3.	If $\frac{dy}{dx} = \frac{1}{y + x^2 y}$ and $y(0) = 2$, find an equation for y in terms of x.
4.	If $\frac{dy}{dx} = \frac{e^x}{y^2}$ and $y(0) = 1$, find an equation for y in terms of x.
5.	If $\frac{dy}{dx} = \frac{y^2}{x^3}$ and $y(1) = 2$, find an equation for y in terms of x.
6.	If $\frac{dy}{dx} = \frac{\sin x}{\cos y}$ and $y(0) = \frac{3\pi}{2}$, find an equation for y in terms of x.
7.	The rate of growth of the volume of a sphere is proportional to its volume. If the volume of the sphere is initially 36π ft^3, and expands to 90π ft^3 after 1 second, find the volume of the sphere after 3 seconds.
8.	Use Euler's Method, with $h = 0.25$, to estimate $y(1)$ if $y' = y - x$ and $y(0) = 2$.
9.	Use Euler's Method, with $h = 0.2$, to estimate $y(1)$ if $y' = -y$ and $y(0) = 1$.
10.	Use Euler's Method, with $h = 0.1$, to estimate $y(0.5)$ if $y' = 4x^3$ and $y(0) = 0$.
11.	Sketch the slope field for $\frac{dy}{dx} = 2x$.
12.	Sketch the slope field for $\frac{dy}{dx} = -\frac{x}{y}$.
13.	Sketch the slope field for $\frac{dy}{dx} = \frac{x}{y}$.

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Answers:

1. $\sqrt[4]{\frac{28x^3}{3} - 236}$	2. $y = 6e^{\frac{5x^3}{3}}$	3. $y = \sqrt{2tan^{-1}x + 4}$
4. $\sqrt[3]{3e^x - 2}$	5. $y = 2x^2$	6. $y = sin^{-1}(cosx)$
7. $\frac{1125\pi}{2}$	8. 4.441	9. 0.328
10. 0.04