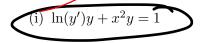
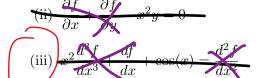
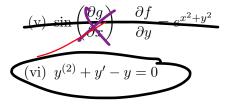
Please show and explain your work where necessary. Good luck!!

1. (3 points) Circle all of the following expression which are ordinary differential equations.



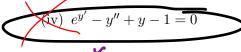


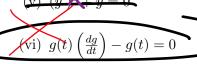
(iv)
$$e^{y''} - y' + y - 1 = 0$$



2. (3 points) Circle all of the following expression which are linear differential equations.

(ii)
$$\sin(x)\frac{d^4f}{dx^4} + \frac{df}{dx} + x^3 + \frac{d^2f}{dx^2} = 0$$
(iii) $y = y = 3$
Of form $y^n \cdot y^1$





Powers more than one

3. (3 points) State the order of the following differential equations.

(i)
$$y + y = x$$



firstorder

(ii)
$$\frac{d^5g}{dt^5} - \frac{dg}{dt} + g(t) = 0$$

(iii)
$$\left(\frac{df}{dx}\right)^3 + \frac{df}{dx} + \cos(x) = \frac{\sqrt{2}f}{dx^2}$$

(iv)
$$y''' - y' + y - 1 = 0$$

(v)
$$(y')y + yx^2 = 0$$

(vi)
$$y^{(4)} - y' - y^2 = 0$$

Order: Second

Order: third

Order: Second

Order: Fourth

4. (1 point) Provide an example of a nonlinear partial differential equation.

