

Name: Tyeon, Cierra

DE4: Solve a separable differential equation.

1. Find the general solution to the differential equation

$$\frac{dy}{dt} = t^5/y.$$

~~$$\frac{dy}{dt} = \frac{t^5}{y}$$~~

Neatly write out your solution, using at least some words of explanation.

Separate variables
by cross-multiplying

$$\int y dy = \int t^5 dt$$

$$\frac{1}{2} y^2 = \frac{1}{6} t^6 + C$$

$$y^2 = 2\left(\frac{1}{6} t^6 + C\right)$$

$$y^2 = \frac{1}{3} t^6 + C$$

$$\sqrt{y^2} = \sqrt{\frac{1}{3} t^6 + C}$$

$$y = \pm \sqrt{\frac{1}{3} t^6 + C}$$

Since we
square-root
to cancel out
 y^2 , must add
+ or - in front

