

6.1 (p 411) # 16

Confirm $y = 3 \sin 2x$ is a

solution of $y^{(4)} - 16y = 0$

If so, $y^{(4)} = 16y$

$$y' = 6 \cos 2x$$

$$y'' = -12 \sin 2x$$

$$y''' = -24 \cos 2x$$

$$y^{(4)} = \underline{48 \sin 2x}$$

$$16(3 \sin 2x)$$

$$\underline{48 \sin 2x}$$

a match!

6.1 (p 411) # 20

Can firm $y = 5 \ln x$ is a

solution of $y^{(4)} - 16y = 0$

IF so $y^{(4)} = 16y$

$$y' = \frac{5}{x} = 5x^{-1}$$

$$y'' = \frac{-5}{x^2} = -5x^{-2}$$

$$y''' = 10x^{-3}$$

$$y^{(4)} = -30x^{-4} = \underline{\underline{\frac{-30}{x^4}}}$$

$$\begin{array}{l} 16(5 \ln x) \\ \underline{80 \ln x} \end{array}$$

Not a match, so
not a solution

6.1 (p 411) # 4b

Integrate to find the solution to

$$\frac{dy}{dx} = \frac{e^x}{4+e^x}$$

$$y = \int \frac{e^x}{4+e^x} dx$$

$$\begin{aligned} u &= 4 + e^x \\ du &= e^x dx \end{aligned}$$

$$y = \int \frac{1}{u} du$$

$$y = \ln |4 + e^x| + C$$