Check by differentiation that $y = 5\cos 2t + 4\sin 2t$ is a solution to $y'' + 4y = 0$ by finding the terms in the sum:

$y'' =$ $-5\cos 2t - 4\sin t$

$4y =$ $5\cos 2t + 4\sin 2t$

So $y'' + 4y =$ 0

Solution:

check $\boxed{y = 5\cos 2t + 4\sin 2t}$

is soln $y'' + 4y = 0$

$y' = 5(-\sin 2t \cdot 2) + 4\cos 2t \cdot 2$

derivative of

$\frac{d}{dt}\sin t = \cos t$

$y' = -10\sin 2t + 8\cos 2t$

$y'' = -20\cos 2t - 16\sin 2t$

$4y = 20\cos 2t + 16\sin 2t$

$f(1) = -2$

$f(x) =$ ______

$f'(x) = 20x^3 + 12x + 8$

ans: $f(x) = 5x^4 + 6x^2 + 8x$

$f(x) = 5x^4 + 6x^2 + 8x + 7$ ←

$f(x) = 5x^4 + 6x^2 + 8x + 123$ ←

$$\boxed{f(x) = 5x^4 + 6x^2 + 8x + C}$$

sub $x=1$, $f(x) = -2$

$-2 = 5\cdot 1^4 + 6\cdot 1^2 + 8\cdot 1 + C$

$-2 = 19 + C$

$$\boxed{-21 = C}$$

$$\boxed{f(x) = 5x^4 + 6x^2 + 8x - 21}$$

Consider the function $f(x) = x^4 + 2\sqrt{x}$.
Let $F(x)$ be the antiderivative of $f(x)$ with $F(1) = -2$.
Then $F(x) =$

Solution:

Goal: find $F(x)$

$\boxed{f(x) = x^4 + 2\sqrt{x}}$

$F(x)$ is antideriv of $f(x)$

$F(1) = -2$

deriv. of $F(x)$

Imagine

Goal: find $f(x)$

find $f(x)$ where

$f'(x) = x^4 + 2\sqrt{x}$ ←

and $f(1) = -2$ ←

$F(x)$ —— $f(x)$

deriv f(x) deriv. f(x)

Results for this submission

Answer Preview
$\frac{7x^{-1}}{-1} + 2\ln(x) - 8x + 17$

The answer above is NOT correct.

Find the particular antiderivative that satisfies the following conditions:

$$\frac{dy}{dx} = 7x^{-2} + 2x^{-1} - 8; \quad y(1) = 4.$$

$y = \frac{7x^{-1}}{-1} + 2\ln(x) - 8x + \cancel{17}$ 19

$\frac{dy}{dx} = 7x^{-2} + 2x^{-1} - 8$?

check: does $y(1) = 4$?
plug in $x=1$, see if $y=4$.

$$\boxed{y = \frac{7x^{-1}}{-1} + 2\ln - 8x + 19}$$

(*) practice for Calc II