Do the side lengths 3,4,5 make a right △?

$\sqrt{(5)^2+(-1)^2+6^2} = \sqrt{62}$

$\sqrt{2^2+2^2} = \sqrt{8}$

$\sqrt{(-3)^2+(-5)^2+8^2} = \sqrt{98}$

$(\sqrt{8})^2+(\sqrt{62})^2 \neq (\sqrt{98})^2$

(21) $a = \begin{bmatrix} 5 \\ -1 \\ -3 \end{bmatrix}$ $b = \begin{bmatrix} 1 \\ 3 \\ -5 \end{bmatrix}$

$a+b = \begin{bmatrix} 6 \\ 2 \\ -8 \end{bmatrix}$ $a-b = \begin{bmatrix} 4 \\ -4 \\ 2 \end{bmatrix}$

$(a+b)\cdot(a-b) = 6\cdot 4 + 2\cdot(-4) + (-8)\cdot(2)$

$= 24 - 8 - 16 = 0$

14E #8 $\int \frac{\cos(\ln x)}{x}\,dx$ $\quad u = \ln(x)$

$du = \frac{1}{x}\,dx$

$= \int \cos(u)\,du = \sin(u) + C$

$= \sin(\ln(x)) + C$

14F #4 $\int_{\ln\frac{\pi}{4}}^{\ln\frac{\pi}{3}} e^x \cos(e^x)\,dx$ $\quad u = e^x$

$du = e^x\,dx$

when $x = \ln\frac{\pi}{4}$

$e^{\ln\frac{\pi}{4}} = \frac{\pi}{4}$

$\int_{\frac{\pi}{4}}^{\frac{\pi}{3}} \cos u\,du$ $\quad x = \ln\frac{\pi}{3}$

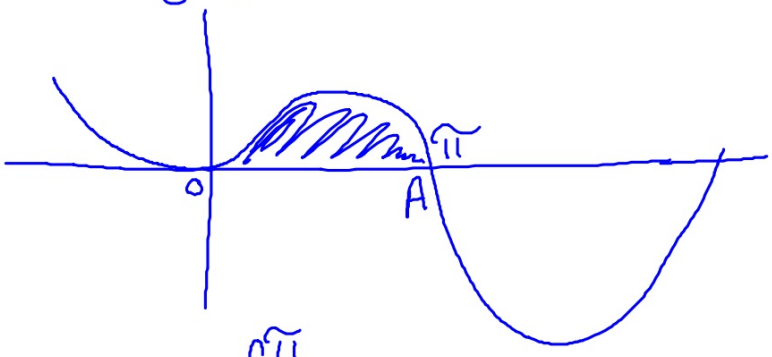
$e^{\ln\frac{\pi}{3}} = \frac{\pi}{3}$

$= \sin u \Big|_{\frac{\pi}{4}}^{\frac{\pi}{3}} = \sin\frac{\pi}{3} - \sin\frac{\pi}{4} = \frac{\sqrt{3}}{2} - \frac{\sqrt{2}}{2} = \frac{\sqrt{3}-\sqrt{2}}{2}$

FINDING THE VOLUME OF A SOLID OF REVOLUTION

$$\int_a^b \pi (f(x))^2 dx = \pi \int_a^b (f(x))^2 dx$$

Ex a portion of the graph of $f(x) = x \sin x$ is shown.



a) Find the area of the shaded region

Find A $f(x)=0$

$x \sin x = 0$

$x=0 \quad \sin x = 0$

$x = 0, \pi, 2\pi$

$$\int_0^{\pi} x \sin(x)\, dx = 3.14$$

b) Find volume of solid of rev.

$$\pi \int_{a=0}^{b=\pi} (x \sin(x))^2 dx \approx 13.8$$

Area between 2 curves

$$\int_a^b ((\text{top}) - (\text{bottom}))\,dx$$

Ex $y_1 = 0.4x$, $y_2 = \sin x$

TO FIND LIMITS OF INTEGRATION – GRAPH ON CALCULATOR & FIND POINTS (X-COORD) OF INTERSECTION

$$\int_0^{2.125} (\underset{\text{top}}{\sin x} - \underset{\text{bottom}}{0.4x})\,dx \approx 0.623$$

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