QUIZ 10   Math 304-06   Solutions   Print your name <u>Master Solver (AI? IA?)</u>
Nov. 17, 2023

Circle your answer(s) to each question. Remember that $i = \sqrt{-1}$.
3 points each. You do not need to show work.
No consultation!—that includes no electronics.

(1) The value of $\frac{2i}{1+3i}$ is

$\frac{2i}{10}$ $\frac{6-2i}{4}$ $\frac{-2i}{10}$ $\frac{1-3i}{4}$ $\frac{1-3i}{10}$ $\frac{i}{4}$ (Missing:) <u>None</u> (the answer is $\frac{6+2i}{10}$)

(2) $|3i - 4| = ?$

<u>5</u>   25 $3i + 4$ $-3i - 4$ $9i^2 + 16$

In the following questions, $\mathbf{u} = \begin{bmatrix} 1 \\ 4 \\ -3 \end{bmatrix}$ and $\mathbf{v} = \begin{bmatrix} 2 \\ 0 \\ 6 \end{bmatrix}$.

(3) The dot product $\mathbf{u} \cdot \mathbf{v}$ is

> 0 $= 0$ <u>≤ 0</u>   None of those $(\mathbf{u} \cdot \mathbf{v} = -16)$

(4) The angle between $\mathbf{u}$ and $\mathbf{v}$ in the previous problem belongs to the set

$\{0\}$ $\{\theta : 0 < \theta < \frac{\pi}{2}\}$ $\{\frac{\pi}{2}\}$ <u>This one: $\{\theta : \frac{\pi}{2} < \theta < \pi\}$</u> $\{\pi\}$ None of those
The dot product is negative so $\theta > \frac{\pi}{2}$. Neither vector is a negative scalar multiple of the other, so they can't be collinear, therefore the angle is $< \pi$.

(5) $\|\mathbf{u}\| = ?$

26   8   2   <u>$\sqrt{26}$</u> $\sqrt{8}$ $\sqrt{2}$ None of those

(6) The unit vector in the direction of $\mathbf{u}$ is

$\frac{1}{26}\mathbf{u}$ $\frac{1}{8}\mathbf{u}$ $\frac{1}{2}\mathbf{u}$ <u>This one: $\frac{1}{\sqrt{26}}\mathbf{u}$</u> $\frac{1}{\sqrt{8}}\mathbf{u}$ $\frac{1}{\sqrt{2}}\mathbf{u}$ None of those