Please PRINT your name _____

No calculators, cell phones, computers, notes, etc.

Circle your answer. Make your work correct, complete and coherent.

The quiz is worth 5 points. The solutions will be posted on my website later today.

Quiz 11, February 26, 2020

The position vector of an object at time t is given by $\vec{r}(t) = \cos(t^2)\,\vec{i} + \sin(t^2)\,\vec{j}$. What is the speed of the object at time t?

ANSWER: The speed of the object at time t is

$$|\vec{r}\,'(t)| = |-2t\sin(t^2)\,\vec{i} + 2t\cos(t^2)\,\vec{j}\,| = \sqrt{4t^2\sin^2(t^2) + 4t^2\cos^2(t^2)}$$

$$= \sqrt{4t^2\Big(\sin^2(t^2) + \cos^2(t^2)\Big)} = \sqrt{4t^2} = \boxed{2|t|}.$$