

Math 233 - Homework 2
September 29, 2021

Name _____
Score _____

The following problems are from the suggested homework. Show all work to receive full credit. Supply explanations when necessary. This assignment is due October 5.

1. (2 points) Parameterize the helix described by $\vec{r}(t) = \cos t\hat{i} + \sin t\hat{j} + t\hat{k}$ using the arc-length parameter, s , from $t = 0$.

2. (2 points) Find the principal unit normal vector for $\vec{r}(t) = (t^3 - 4t)\hat{i} + (5t^2 - 2)\hat{j}$ at $t = 0$.

Turn over.

3. (2 points) Find the curvature of the curve described by $y = x - \frac{1}{4}x^2$ at the point where $x = 2$.

4. (2 points) A projectile is fired at a height of 1.5 m above the ground with an initial speed of 100 m/s and at an angle of 30° above the horizontal. Determine the range of the projectile.

5. (2 points) A golf ball is hit in a horizontal direction off the top edge of a building that is 100 ft tall. How fast must the ball be launched to land 450 ft away from the building?