Polar, Parametric and Vectors

	4 – Mastery	3 – Proficient	2 - Basic	1 – Below Basic	0 – No Evidence
Calculate the derivatives of vectors, parametric and polar functions (CHA-3.G, CHA-3.H, FUN-3.G)	Can Extend thinking beyond the standard, including tasks that may involve one of the following: • Designing • Connecting • Synthesizing • Applying • Justifying • Critiquing • Analyzing • Creating • Proving	Can calculate the derivatives for **all** of the following function types: • Polar • Parametric • Vectors **Follows math practices of algebraic computation, precision and reasoning***	Can calculate the derivatives for **two** of the following function types: • Polar • Parametric • Vectors	Can calculate the derivatives for **one** of the following function types • Polar • Parametric • Vectors	Little evidence of reasoning or application to solve the problem Does not meet the criteria in a level 1
Use derivatives to analyze particle motion using vectors and parametric functions. (FUN-8.B)		Find **all** of the following: • Velocity • Acceleration • Change of Speed **Follows math practices of algebraic computation, precision and reasoning***	Find **two** of the following: • Velocity • Acceleration • Change of Speed	Find **one** of the following: • Velocity • Acceleration • Change of Speed	
Use the definite integral to find the distance and position of a particle moving along a curve given by parametric or vector-valued functions. (FUN-8.A, FUN-8.B)		Can do **all** of the following: • Distance traveled • Displacement • Solve initial value problems • Average value **Follows math practices of algebraic computation, precision and reasoning***	Can do **three** of the following: • Distance traveled • Displacement • Solve initial value problems • Average value	Can do **two** of the following: • Distance traveled • Displacement • Solve initial value problems • Average value	
Find the length of a curve defined parametrically. (CHA-6.B)		Find the arc length of a function **with correct bounds** and coefficients. **Follows math practices of algebraic computation, precision and reasoning***	Find the arc length of a function **with correct coefficients.**	Find the arc length of a function.	
Find the area bounded by a polar curve. (CHA-5.D)		Sets up the integral for the area of a polar curve with correct bounds and **coefficients**. **Follows math practices of algebraic computation, precision and reasoning***	Sets up the integral for the area of a polar curve **with correct bounds.**	Sets up the integral for the area of a polar curve.	

*Math Practices for AP Calculus include:

- Algebraic processes and computations completed logically and correctly
- Attend to precision graphically, numerically and analytically
- Clearly present reasoning and justification with accurate and precise language