

IMP 11: Math Review for Test 2

Scalar Parametric Equations for a Curve for $x = x(t), y = y(t)$

Eliminate the parameter and sketch in the curve xy -plane.

Find parametrizations of graphs of functions, lines, and circles.

Problems: page 95 #5,11

Vectors in the Plane

Find sums, differences, scalar multiples, and magnitude graphically and via components.

Find components of a vector given the endpoints, and given the magnitude and direction.

Problems: page 804 #7b,9a,13b,25b

Vector Parametric Equations for $\mathbf{r}(t) = \langle x(t), y(t) \rangle = x(t)\mathbf{i} + y(t)\mathbf{j}$

Sketch a graph of the curve, including $\mathbf{r}(t_0)$ and $\mathbf{r}'(t_0)$ for a given $t = t_0$

Compute velocity $\mathbf{v}(t)$, acceleration $\mathbf{a}(t)$, and speed $\frac{ds}{dt}$ of a moving particle

Compute vector and scalar displacement, and distance traveled (arc length), for $t_0 \leq t \leq t_1$

Problems: page 864 #27; page 874 #15; page 908 #3, 25; page 420 #9

Applications of the Derivative

Find the intervals on which a function is increasing/decreasing.

Find critical numbers and relative extrema.

Determine concavity and inflection points.

Do curve sketching problems

Do applied max/min and related rates problems.

Problems: page 268#7,17; page 298#11,19; page 224#21,29

Inverse Functions

Show that two function are inverses of eachother.

Determine graphically if a function has an inverse (and find it)

Problems: page 450 #1cd

Exponential, Logarithmic, and Inverse Trig Functions

Find exponentials and logs.

Know the laws of exponents and logs.

Know the definitions of $\sin^{-1} x$ and $\tan^{-1} x$, and how to use them.

Know the derviative of exp, log, and inverse trig functions

Problems: page 460#9,15; page 469#7,15,21,25; page 497#3,13a, 27a, 31

Integration

Know integrals involving exp, log, trig, and inverse trig functions (see list)

Know integration by parts

Problems: See Monday HW

Study notes, homework, and quizzes. Good luck on Thursday!