

## Calculus and Vectors Exam Review

### Calculus

1.4: The Limit of a Function – page 37 number 6-8, 10

1.5: Properties of Limits – page 45 number 7-9, 16 (use any valid algebraic technique)

Review Exercise – page 56 number 16, 17

Chapter Test – page 60 number 7, 8

2.1: The Derivative Function – page 73 number 6, 7 (derivative by first principles)

2.2: The Derivatives of Polynomial Functions – page 82 number 4bdf, 7bd, 9bdf, 15, 25

2.3: The Product Rule – page 90 number 5bdf, 9, 12, 14

2.4: The Quotient Rule – page 97 number 4, 11

2.5: The Derivative of Composite Functions (aka the Chain Rule) – page 105 # 4, 8 (do not simplify), 14, 19

3.1: Higher Order Derivatives, Velocity and Acceleration – page 127 number 3 bdf, 10, 12

3.2: Maximum and Minimum on an Interval (Extreme Values) – page 137 number 4 bdf, 8

3.3: Optimization Problems – page 145 number 4, 10, 11, 16

3.4: Optimization Problems in Economics and Science - Page 151 number 5, 14

4.1: Increasing and Decreasing Functions - page 169 number 3, 5

4.2: Critical Points, Local Maxima and Local Minima – page 178 number 3, 5

4.3: Vertical and Horizontal Asymptotes – page 193 number 7ab, 15

Mid Chapter Review: page 196 number 4, 7

4.4: Page 205 number 1, 3

4.5: page 213 numberr 4efi

5.1: Derivatives of Exponential Functions,  $y = e^x$  – page 232 number 2bdf, 3bdf, 4

5.2: The Derivative of the General Exponential Function,  $y = b^x$  – page 240 number 1bdf, 2bd, 4

5.3: Optimization Functions Involving Exponential Functions – page 246 number 11

5.4: The Derivatives of  $y = \sin x$  and  $y = \cos x$  – page 256 number 1bdfhj, 2bdf, 6 (don't have to verify by graphing), 9

5.5: The Derivative of  $y = \tan x$  – page 260 number 1 bdf, 4, 6, 10

## Vectors

6.1: Introduction to Vectors - page 279 number 5,7,11

6.2: Vector Addition – page 290 number 4-7, 13, 15

6.3: Multiplication of a Vector by a Scalar – page 299 number 7, 15, 17, 18

Mid Chapter Review – page 308 number 2, 7, 12, 13, 15

6.5: Vectors in  $\mathbb{R}^2$  and  $\mathbb{R}^3$  - page 318 number 18, 19

6.6: Operations with Vectors in  $\mathbb{R}^2$  - page 324 number 15, 17

6.7: Operations with Vectors in  $\mathbb{R}^3$  - page 333 number 11, 15

6.8: Linear Combinations and Spanning Sets – page 340 number 13, 15

7.1: Vectors as Forces - Page 363 number 10, 16

7.2: Velocity – page 369 number 11, 13

7.3: The Dot Product of Two Geometric Vectors – page 377 number 6bdf, 7bdf, 9, 14, 16

7.4: The Dot Product of Algebraic Vectors – page 385 number 6bd, 11, 14, 17

Mid Chapter Review – page 388 number 1, 2, 7, 10, 11, 13, 16

7.5: Scalar and Vector Projections – page 398 number 6, 7, 9a, 11

7.6: Cross Product of Two Vectors – page 407 number 3, 4bdf, 5

7.7: Application of the Dot Product and Cross Product – page 414 number 4bd, 5, 6, 8

8.1: Vector and Parametric Equations of a Line in  $\mathbb{R}^2$ : page 433 number 4, 10, 11, 13

8.2: Cartesian Equation of a Line: Page 443 number 6-8, 12

8.3: Vector, Parametric and Symmetric Equations of a Line in  $\mathbb{R}^3$  - page 449 number 1bdf, 2bdf, 5bdf, 6, 9, 15

8.4: Vector and Parametric Equations of a Plane – page 459 number 9, 15

8.5: The Cartesian Equation of a Plane – page 468 number 9, 10, 13, 15

9.1: The intersection of a Line with a Plane and the Intersection of Two Lines – page 496 number 7,8

9.2: Systems of Equations – page 509 number 12 bdf

9.3: Intersection of Two Planes – page 516 number 6ace (and 7 ace)

9.4: The Intersection of Three Planes – page 531 number 13

