Exam 2 covers sections 10.1, 10.2, 10.3, 10.4, 10.5, 10.6


2. Your exam will contain THREE Basic Skills No Partial Credit problems (BSA questions). One each will come from 10.2, 10.3 and 10.4.

3. There MAY BE up to 5 True-False Questions or Multiple Choice Questions on your exam. True-False will come from the end-of-chapter reviews. I may change the wording on the questions and thereby also change them from True to False or vice versa - so be sure to read these carefully on your exam. Multiple Choice questions will either be conceptual or simple calculations.

4. There will be 4 - 5 partial credit problems on the exam.

5. For 10.1: Be comfortable both sketching the path of a set of parametric equations making sure to indicate the direction of motion AND be comfortable eliminating the parameter to transform the parametric equations to a rectangular equation (remember to check restrictions on x and y). Note that answers involving inverse trig functions will NOT receive full credit.

6. For 10.2: You need to be able to find \( \frac{dy}{dx} \) to find the slope of a tangent line at a specified value, to find \( t \) values where the slope is horizontal or vertical or to find the equation of the tangent line. You need to be able to find \( \frac{d^2 y}{dx^2} \) and determine where a curve is concave up or down. You need to be able to find the length of a curve given parametrically.

7. For 10.3: Know the transformation equations from polar to rectangular. You may be asked to convert an equation given in polar to rectangular (problems 15 - 20 in 10.3) or convert a rectangular equation to polar (problems 21 - 26 in 10.3). You may be asked to find the slope of the tangent line to a polar curve at a specified value of \( \theta \) or find the \( \theta \) values where the tangent line is horizontal or vertical.

8. For 10.4: Be comfortable finding polar area. You are likely to either be asked to find the area of one loop (see Example 1 in 10.4) or the area inside one polar curve and outside a second polar curve (see Example 2 in 10.4 and problems 23 - 28). You may also be asked to find the exact length of a polar curve (problems 45, 46 and 47 in 10.4). Note that polar graphs, if needed, will be given to you for any of these problems.

9. For 10.5: The standard equations for a parabola, ellipse and hyperbola shifted with center/vertex at \((h,k)\) are given to you (see below). A problem from this section will have 1, 2 or 3 of the following parts: identify the conic section, write the conic section in standard form, sketch the conic section. The type of equation you should be comfortable with are ones like 10.5 problems 15, 16, 23, 24, 27, 28, 29, 30 or Chap 10 review problems 45 and 46. Note that writing the equation in standard form implies that you must complete the square to determine the \((x-h)\) and/or \((y-k)\) terms.

10. For 10.6: Don’t worry about the specifics of how to tell that a given polar equation is a parabola, ellipse or hyperbola. I may ask you to transform a polar equation that is a conic section into rectangular and then identify the conic section (see equations like those in 10.6 9 - 16).

Formulas given on back cover of your test

Standard Equations for Conic Sections

Parabola

\[(x - h)^2 = 4p(y - k)\]
\[(y - k)^2 = 4p(x - h)\]

Ellipse

\[\frac{(x - h)^2}{a^2} + \frac{(y - k)^2}{b^2} = 1\]
\[\frac{(x - h)^2}{b^2} + \frac{(y - k)^2}{a^2} = 1\]

Hyperbola

\[\frac{(x - h)^2}{a^2} - \frac{(y - k)^2}{b^2} = 1\]
\[-\frac{(x - h)^2}{b^2} + \frac{(y - k)^2}{a^2} = 1\]

Directions found on the front cover of your test

Use of books, notes or calculators is NOT permitted.

Please show all your work! Answers without appropriate supporting work may not receive full credit.

Clearly indicate your answers to each problem by underlining them or placing a box around your answers!

Trigonometric functions at the values 0, π/6, π/4, π/3, π/2, etc must be evaluated!

Basic Skills Questions, T/F and Multiple Choice Questions are graded with NO PARTIAL CREDIT. For Basic Skills questions only answers placed in the box provided will be graded.

Basic Skills questions are on a separate sheet from the rest of the exam. Make sure your name is on both parts of your exam!