

Video Topics

The asterisks represent the difficulty level of these topics. Due dates below

Chapter 1 (topics 1-16): Due March 6

1. **Section 1.1: Graphing lines [e.g. example 3, 4; also see section 1.3, 1.4]
2. **Section 1.1: Understanding and applying the distance formula, and the midpoint formula [e.g. examples 6, 7, 8, 9]
3. ***Section 1.1: Circles (the equation and it's meaning) [e.g. example 10, 12, 13]
4. ***Section 1.2: Domain and range: explain the concepts of the "domain" and "range" of a function [example 9 will help]
5. *(Section 1.2: Functions: explain why the vertical line test works, and how we can use it to determine if a plotted relation is a function
6. ***Section 1.2: Domain: Explain how to find the domain of a function [e.g. example 8; also see section 3.5 example 1]
7. *Section 1.3: Slope: Explain the relationship between slope and rate of change [e.g. examples 3, 4]
8. **Section 1.4: Parallel and perpendicular lines [e.g. example 7, 8]
9. ***Section 1.4: Linear regression and correlation coefficient [e.g. example 10]
10. *Section 1.5: Finding relative minima and maxima using the graphing calculator [e.g. example 2]
11. ****Section 1.5: Piecewise functions: Explain what they are, how to understand them, and how to graph them [e.g. example 5]
12. **Section 1.6: New Notation for the sum, differences, products, and quotients of functions [e.g. example 1]
13. ***Section 1.6: Composition of functions [e.g. example 4, 5]
14. ***Section 1.7: Symmetry: Explain x-axis, y-axis, and origin symmetry and how to determine if a function has a symmetry visually and algebraically.
15. ****Section 1.7: Vertical translation and horizontal translation of the seven base functions [e.g. example 4]
16. ***Section 1.7: Reflection over x-axis, and vertical stretching

Chapter 2 (topics 17-26): Due March 13

17. **Section 2.1: Solving an equation on your graphing calculator using the intersect method [e.g. example 1, 2]
18. **Section 2.2: Complex numbers: Explain what they are, and how to add, subtract, multiply, and divide them
19. ****Section 2.3: Completing the square: Explain how to complete the square of a quadratic equation [e.g. example 4]
20. **Section 2.3: Quadratic formula: Explain how to solve a quadratic equation using the quadratic formula [e.g. example 5, 6]
21. ***Section 2.3: The Discriminant: Explain the concept of the discriminant, and what it can tell you about a quadratic equation.

22. ****Section 2.4: Parabola transformation: Explain how you can complete the square to find the vertex of a quadratic. Then introduce the formula for the vertex of the parabola [e.g. example 2, 3, 4]
23. ****Section 2.5: Rational/Fraction Equations: Explain how to solve them [e.g. example 1, 2]
24. ****Section 2.5: Radical Equations: Explain how to solve them [e.g. example 3, 4]
25. **Section 2.5: Absolute Value Equations: Explain how to solve them [e.g. example 5]
26. ***Section 2.6: Compound Inequalities: Explain how to solve them [e.g. example 2, 3]

Chapter 3 (topics 27-39): March 13

27. *Section 3.1: Terminology: Explain the terms polynomial, leading term, leading coefficient, degree, constant, linear, quadratic, cubic, and quartic.
28. **Section 3.1: End behavior: Explain how the leading term test shows you end behavior of a polynomial [e.g. example 1]
29. **Section 3.1: Multiplicity: Explain how zeros can have even or odd multiplicity and what that means graphically
30. ****Section 3.1: Regressions: Explain how to perform quadratic, cubic, and quartic regressions on your graphing calculator, and how to determine which is the best model [e.g. example 9]
31. **Section 3.1: Finding real zeros on the calculator: Explain how to do this [e.g. example 7]
32. ****Section 3.2: Given a cubic or quartic polynomial, explain how to factor, find zeros, and graph the polynomial [e.g. example 1, 2, 3]
33. ***Section 3.3: Polynomial division: Explain how to perform long division and synthetic division [e.g. example 1, 2, 5]
34. **Section 3.4: Given the zeros of a polynomial, show how to find the polynomial [e.g. example 1, 2]
35. ****Section 3.4: The Rational Zeros Theorem: Explain how to use the rational zeros theorem to factor polynomials into linear factors [e.g. example 5, 6]
36. ****Section 3.5: Asymptotes: Explain how to find vertical, horizontal, and oblique asymptotes of rational functions [e.g. example 3, 4, 5, 6, 7]
37. ***Section 3.5: Explain how to find the x- and y-intercepts of rational functions
38. ****Section 3.6: Polynomial Inequalities: Show how to solve polynomial inequalities [e.g. example 1, 2]
39. ****Section 3.6: Rational Inequalities: Show how to solve rational inequalities [e.g. example 3]
40. ***Section 3.7: Explain direct and inverse variation

Chapter 4 (topics 41-52): Due April 3

41. ***Section 4.1: Inverse: Explain what an inverse is, how to find if a function has an inverse *function* (horizontal line test), how to draw an inverse function

- (reflection over the line $y=x$), and how to find an inverse function [e.g. example 3, 4, 5]
42. ***Section 4.2: Exponential Growth and Decay: Explain exponential growth and decay, and how the graphs of each of them look
 43. ***Section 4.2: Graphing exponential functions: Explain how exponential functions can be translated right, left, up, and down [e.g. example 3]
 44. ***Section 4.2: Compound Interest [e.g. example 4]
 45. ****Section 4.3: Explain what a logarithm is, where it comes from, and why it is useful
 46. ***Section 4.3: Explain how to convert between logarithmic and exponential equations [e.g. example 3, 4]
 47. **Section 4.3: Change of Base Formula: Explain how to use this to find logarithms on your calculator [e.g. example 7, 8]
 48. ***Section 4.4: Logarithm Rules: The product rule, quotient rule, and exponent rule to break apart a logarithm into simplest terms [e.g. example 1, 2, 3, 4, 5]
 49. ***Section 4.4: Logarithm Rules: The product rule, quotient rule, and exponent rule to combine multiple logarithms into a single logarithm [e.g. example 6, 7]
 50. ***Section 4.5: Exponent Equations: Explain how to solve exponent equations using logarithms [e.g. example 1, 2, 3]
 51. ***Section 4.5: Logarithmic Equations: Explain how to solve logarithmic equations using exponents [e.g. example 5, 6, 7, 8]
 52. ****Section 4.6: Population Growth and Compound Interest: Show how to use exponential models to show how to solve problems involving population growth and compound interest [e.g. example 1, 2]

**SKILLS [only Mr. Martin's Class may sign up for these] (topics 53-57)
Due April 10**

53. How to factor quadratics
54. How to factor cubics by grouping
55. Exponent rules
56. Powers of i
57. Simple Interest

Grading Rubric

You are expected to have emailed a working video link to Mr. Martin/Mr. Shah by your due date (*no exceptions*). This assignment is worth 30 points. The grading rubric:

- 5 pts:** The video has been completed and turned in *on time* (by 11:59pm)
- 5 pts:** You write up a brief explanation of what you're going to do. Specifically, what problem you're going to use, or what explanation you're going to give, and have Mr. Martin/Mr. Shah review it *before* you record you. **We will have a 1 or 2 day turn around with these, so please get them to us early.**
- 4 pts:** You chose an appropriate sample problem (or problems) to address your topic. You may use example problems from the book, but if you use the same problems, you will get only 2 of 4 points. We suggest you change the problem a bit, or the numbers, or choose homework exercises.
- 15 pts:** Your video clearly elaborates on your topic (10 pts), with no mistakes in explanation or mathematics (5 pts). The difficulty level of the problem you chose will be taken in account when grading this part.
- 1 pts:** There are no technical issues with your recording (e.g. volume level hard to hear)

You can gain one extra credit point if you incorporate humor and you get me to chuckle, snort, or snortle, or even more difficult, to laugh.

Each day the video is late will cost you 3 points.