

Math 116 - Concepts to be covered in 16 weeks assuming 32 class periods**NOTES:**

- 1. Allow students to use the TI 30X IIS or IIB Scientific Calculator! Show how to use this calculator in class!**
- 2. Only discuss the chapters and Learning Outcomes*** stated. DO NOT discuss any other chapters or Learning Outcomes.**
- 3. This is a survey course. Don't go into too many details!**

***** Learning Outcomes are clearly stated at the beginning of each chapter in the text and subdivide each chapter into several distinct topics!**

Period 1: A review of whole numbers and decimals.

It is expected that students already known how to round decimals and how to add, subtract, multiply, and divide whole numbers and decimals. This is a review only and should not take any longer than one class period! It is suggested that students be given an appropriate worksheet.

Cleaves and Hobbs College Mathematics: Ch 1, Sec 1, Learning Outcomes (LO) 1, 3, 4, 5, 6

Homework: Pages 26-30, # 1-10, 17-51, 63-125

Period 2: A review of fractions and mixed numbers.

It is expected that students already known how to

- **express fractions in lowest terms**
- **express improper fractions as mixed numbers and vice versa**
- **convert fractions and mixed numbers to decimals and vice versa**
- **add, subtract, multiply, and divide fractions and mixed numbers**

This is a review only and should not take any longer than one class period! It is suggested that students be given an appropriate worksheet.

Cleaves and Hobbs College Mathematics:

Ch 2, Sec 2, Learning Outcomes (LO) 1-5

Ch 2, Sec 3, LO 1, 2

Ch 2, Sec 4, LO 1-4

Homework: Pages 80-82, # 11-110, 120-134

Pages 87-89, # 1-53

Page 100, # 1-15, 20-40

Period 3: An Introduction to Exponents and Roots

While the text does not show this, it is suggested that radicals of index other than 2 also be introduced. ONLY SHOW RATIONAL NUMBERS AND USE THE CALCULATOR !

It is further recommended that it be shown that the index is related to a power. Namely, that $\sqrt[n]{b} = b^{1/n}$. Do not discuss or show anything else yet !!!

Cleaves and Hobbs College Mathematics: Ch 1, Sec 2, Learning Outcomes (LO) 1, 2

Homework: Page 35, # 1-36, 49-56

Period 4: The Order of Operation

It is recommended that it be shown how to evaluate $b^{1/n}$ on the calculator. Since parentheses are necessary it can be considered part of the Order of Operation.

Cleaves and Hobbs College Mathematics: Ch 1, Sec 3, Learning Outcome (LO) 1

Homework: Page 47, # 1-39

Period 5: The U.S. Customary System of Measurement

Cleaves and Hobbs College Mathematics: Ch 2, Sec 5, Learning Outcomes (LO) 1, 3, 4, 5

Homework: Pages 113-115, # 1-12, 21-90

Period 6: The Metric System and other Measures

Cleaves and Hobbs College Mathematics:

Ch 4, Sec 1, Learning Outcomes (LO) 1-3

Ch 4, Sec 2, LO 3

Ch 4, Sec 3, LO 1

Homework: Pages 181-182, # 23, 28, 30, 31, 33, 36, 37, 53, 54, 61, 62, 64, 65, 74, 75, 77, 78, 80, 82, 83, 85, 86,
88, 89, 90, 96, 98, 100

Page 188, # 19-42

Page 190, # 1-41

Period 7: Test 1 Review (Optional)

Period 8: Test 1

Period 9: Signed Numbers

Cleaves and Hobbs College Mathematics:

Ch 5, Sec 1, Learning Outcomes (LO) 1- 3

Ch 5, Sec 2, LO 1, 2

Ch 5, Sec 3, LO 1-3

Ch 5, Sec 4, LO 1-3

Homework: Page 218, # 1-64

Pages 224 - 225, # 1-90

Pages 232 - 233, # 6-62, 69-74

Period 10: Powers of 10 and Scientific Notation

Cleaves and Hobbs College Mathematics:

Ch 5, Sec 5, Learning Outcome (LO) 1

Ch 5, Sec 6, LO 1, 2, 3 (use calculator)

Homework: Page 237, # 1-40

Page 246, # 1-26, 37-45

Period 11: Solving Linear Equations in One Variable

Cleaves and Hobbs College Mathematics:

Ch 7, Sec 1, Learning Outcomes (LO) 1, 4

Ch 7, Sec 2, LO 1-4

Ch 7, Sec 3, LO 1

Ch 7, Sec 4, LO 1

Homework: Pages 306-307, # 45-58

Pages 314-315, # 1-72

Pages 318-319, # 1-23

Page 331, # 22, 23, 24, 26, 27, 28, 29, 30, 31, 33, 34, 35, 36

Period 12: Percents, Ratios, and Proportions

It is recommended that you show the simple percent problems using variables and the formula
Percentage = Rate(Base)

Cleaves and Hobbs College Mathematics:

Ch 3, Sec 1, Learning Outcomes (LO) 1, 2

Ch 3, Sec 2, LO 1, 2

Ch 8, Sec 1, LO 1

Ch 8, Sec 2, LO 1

Homework: Page 138, # 3-34

Pages 152-153, # 13-62

Page 356, # 1-23

Page 363, #1-23

Period 13: Graphical Representation of Linear Equations in Two Variables

Cleaves and Hobbs College Mathematics:

Ch 9, Sec 1, Learning Outcomes (LO) 1, 3, 4
Ch 9, Sec 2, LO 1

Homework: Pages 391-392, # 1-15, 51-70
Page 402, # 1-6

Period 14: Algebraic Representation of Linear Equations in Two Variables

Cleaves and Hobbs College Mathematics:

Ch 9, Sec 3, Learning Outcomes (LO) 1, 2
Ch 9, Sec 4, LO 1-3

Homework: Page 407, # 1-12
Page 417, # 1-20

Period 15: Test 2 Review (Optional)

Period 16: Test 2

Period 17: The Laws of Exponents

Cleaves and Hobbs College Mathematics: Ch 11, Sec 1, Learning Outcomes (LO) 1-3

Homework: Pages 460-461, # 1-60

Period 18: Polynomials

Cleaves and Hobbs College Mathematics:

Ch 11, Sec 2, Learning Outcome (LO) 1 (vocabulary only)
Ch 11, Sec 3, LO 1, 2, 3, 5

Homework: Pages 477-478, # 1-27, 43-69, 109-124

Period 19: An Introduction to Irrational and Imaginary Numbers

Cleaves and Hobbs College Mathematics:

Ch 12, Sec 1, Learning Outcomes (LO) 1, 2
Ch 12, Sec 4, LO 1

Homework: Use the calculator! Do not show simplifying of radicals !!!

Page 490, # 7-14, 16-22
Page 510, # 1 & 2

Add the following exercises to be done on the calculator! Do not discuss simplifying of radicals !!!

Perform the following operations. Round your answers to two decimal places.

- | | | | | | |
|--------------------|--------------------|--------------------|---------------------|--------------------|--------------------|
| 1. $\sqrt{40}$ | 2. $\sqrt{68}$ | 3. $\sqrt{12}$ | 4. $\sqrt{120}$ | 5. $\sqrt{17}$ | 6. $\sqrt{20}$ |
| 7. $\sqrt{10}$ | 8. $\sqrt{18}$ | 9. $\sqrt{32}$ | 10. $\sqrt{7}$ | 11. $\sqrt{5.4}$ | 12. $\sqrt{4.5}$ |
| 13. $\sqrt[3]{16}$ | 14. $\sqrt[3]{37}$ | 15. $\sqrt[3]{49}$ | 16. $\sqrt[3]{100}$ | 17. $\sqrt[4]{20}$ | 18. $\sqrt[5]{30}$ |
| 19. $\sqrt[6]{62}$ | 20. $\sqrt[4]{85}$ | 21. $\sqrt[7]{10}$ | 22. $\sqrt[9]{11}$ | 23. $\sqrt[3]{20}$ | 24. $\sqrt[5]{50}$ |

Perform the following operations. Write any imaginary numbers in terms of "i". Write any radical as a decimal approximation rounded to two decimal places!

- | | | | | | |
|---------------------|---------------------|----------------------|----------------------|----------------------|----------------------|
| 25. $\sqrt{-324}$ | 26. $\sqrt{-784}$ | 27. $\sqrt{-900}$ | 28. $\sqrt{-196}$ | 29. $\sqrt{-40}$ | 30. $\sqrt{-22}$ |
| 31. $\sqrt{-200}$ | 32. $\sqrt{-600}$ | 33. $\sqrt{-12}$ | 34. $\sqrt{-120}$ | 35. $\sqrt[3]{-241}$ | 36. $\sqrt[3]{-326}$ |
| 37. $\sqrt[3]{-25}$ | 38. $\sqrt[3]{-37}$ | 39. $\sqrt[5]{-125}$ | 40. $\sqrt[5]{-225}$ | 41. $\sqrt[5]{-55}$ | 42. $\sqrt[5]{-324}$ |

SOLUTIONS

- | | | | | | |
|------------|------------|-----------|------------|-----------|-----------|
| 1. 6.32 | 2. 8.25 | 3. 3.46 | 4. 10.95 | 5. 4.12 | 6. 4.47 |
| 7. 3.16 | 8. 4.24 | 9. 5.66 | 10. 2.65 | 11. 2.32 | 12. 2.12 |
| 13. 2.52 | 14. 3.33 | 15. 3.66 | 16. 4.64 | 17. 2.11 | 18. 1.97 |
| 19. 1.99 | 20. 3.04 | 21. 1.39 | 22. 1.31 | 23. 2.71 | 24. 2.19 |
| 25. 18i | 26. 28i | 27. 30i | 28. 14i | 29. 6.32i | 30. 4.69i |
| 31. 14.14i | 32. 24.49i | 33. 3.46i | 34. 10.95i | 35. -6.22 | 36. -6.88 |
| 37. -2.92 | 38. -3.33 | 39. -2.63 | 40. -2.95 | 41. -2.23 | 42. -3.18 |

Period 20: Solving Quadratic Equations in One Variable

Cleaves and Hobbs College Mathematics:

Ch 13, Sec 1, Learning Outcome (LO) 1 ONLY ! DO NOT SHOW FACTORING OF SPECIAL PRODUCTS !!!

Ch 15, Sec 1, LO 1-3

Ch 15, Sec 2, LO 1

Ch 15, Sec 3, LO 2

Homework: **Round irrational answers to a certain number of decimal places !!!**

Page 522, # 1 - 21

Pages 575-576, # 1-27, 32-43

Page 579, # 1-12

Page 587, # 19-26, 29, 30

Period 21: An Introduction to Exponential Equations

Cleaves and Hobbs College Mathematics: Ch 16, Sec 1, Learning Outcomes (LO) 1, 2

Homework: Page 633, # 1-4, 18, 20, 22, 24, 26

Period 22: An Introduction to Logarithmic Equations

Cleaves and Hobbs College Mathematics: Ch 16, Sec 2, Learning Outcomes (LO) 1-5

Homework: Page 644, # 1-37

Period 23: Review for Test 3 (Optional)

Period 24: Test 3

Period 25: An Introduction to Angles and Simple Geometric Figures

Cleaves and Hobbs College Mathematics:

Ch 18, Sec 1, Learning Outcomes (LO) 1, 2, 4

Ch 18, Sec 2, LO 1, 2

Ch 18, Sec 3, LO 1

Homework: Page 703, # 13, 14, 15, 20-32, 39-48

Pages 713-716, # 1, 3, 7, 9, 15, 19, 24, 25, 29, 31, 35, 39, 43, 47
Page 728, # 1-18

Period 26: Volume and Surface Area

Cleaves and Hobbs College Mathematics: Ch 18, Sec 4, LO 1, 2

Homework: Pages 738-739, # 1, 2, 5, 6, 7, 11, 17, 18, 20, 26

Period 27: Types of Triangles and the Pythagorean Theorem

Cleaves and Hobbs College Mathematics:

Ch 19, Sec 1, Learning Outcome (LO) 1

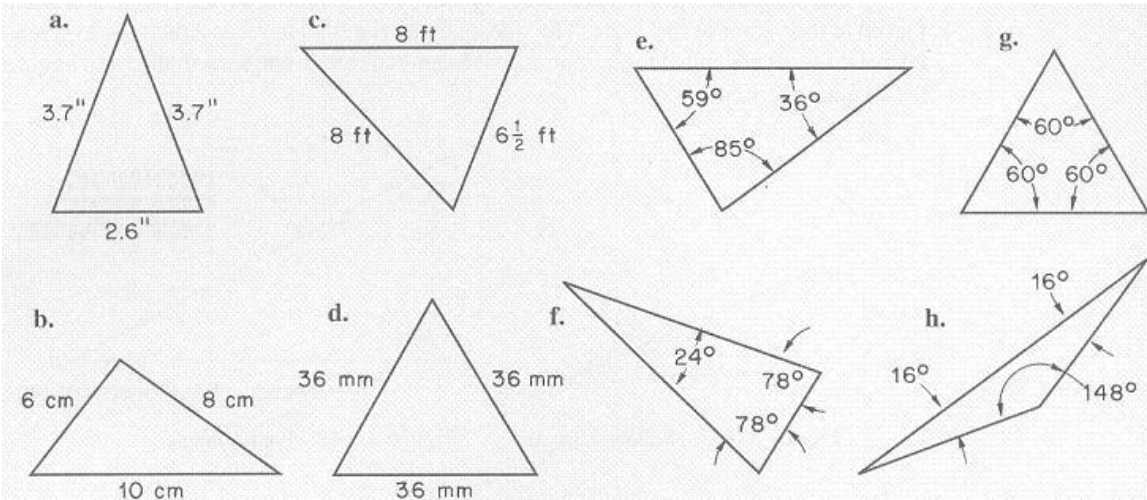
Ch 19, Sec 2, LO 1, 2, 3

Homework: Page 764, # 1-7

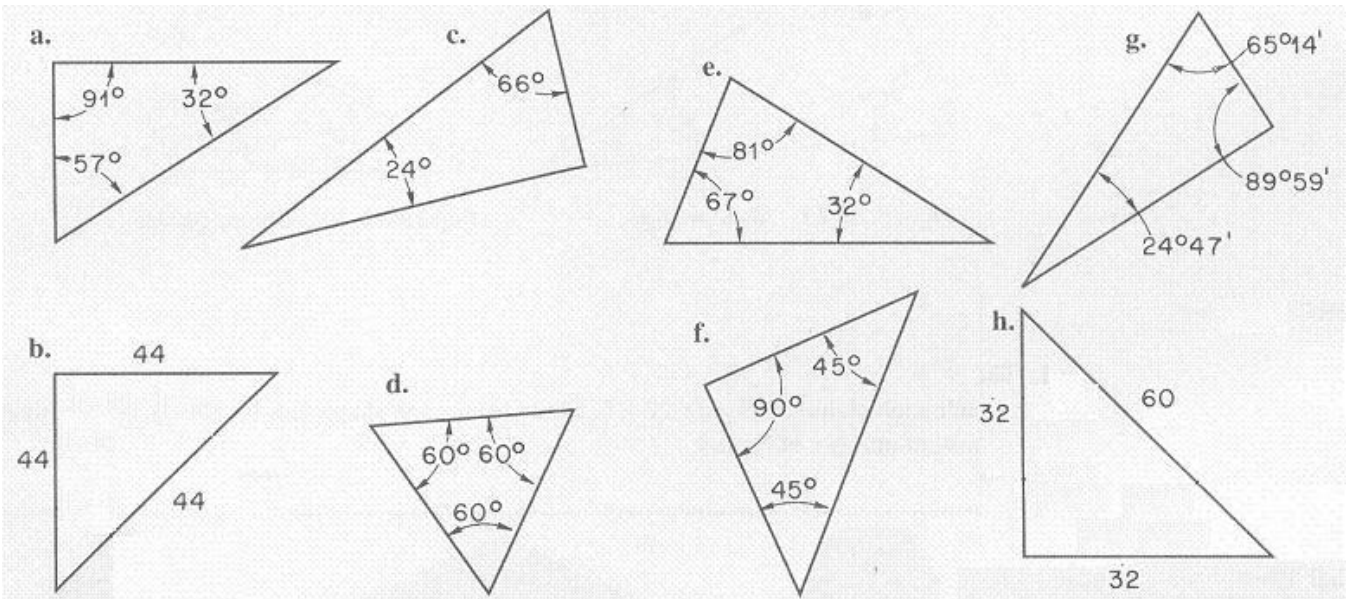
Pages 771-773, # 1-6, 9, 14-24, 27

Then add the following exercises.

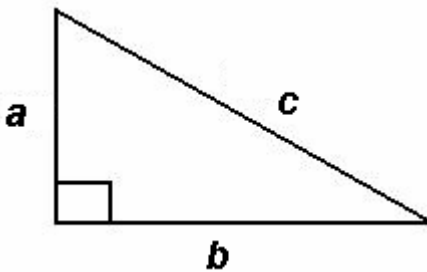
1. Identify each of the triangles as scalene, isosceles, or equilateral. If a scalene or isosceles triangle has a right angle, say so!



2. Identify each of the triangles as scalene, isosceles, or equilateral. If a scalene or isosceles triangle has a right angle, say so!

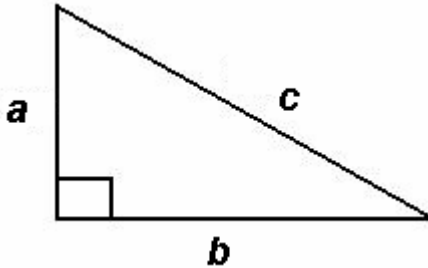


In #3 - 6, use the following figure to find the hypotenuse.



3. If $a = 5$ and $b = 13$ cm, find c . Round to one decimal place.
4. If $a = 7$ and $b = 9$, find c . Round to one decimal place.
5. If $a = 8$ and $b = 8$, find c . Round to one decimal place.
6. If $a = 6$ and $b = 6$ cm, find c . Round to one decimal place.

In #7 - 10, use the following figure to find the indicated leg.



7. If $a = 6$ and $c = 14$ cm, find b . Round to one decimal place.
8. If $a = 7$ and $c = 9$, find c . Round to one decimal place.
9. If $b = 8$ and $c = 18$, find c . Round to one decimal place.
10. If $b = 6$ and $c = 16$ cm, find c . Round to one decimal place.

Applications of the Pythagorean Theorem

11. A ladder 10 feet long leans against a wall. The foot of the ladder is 6 feet from the base of the wall. How high up the wall does the top of the ladder rest? Assume that the ladder is the hypotenuse of a right triangle! Omit the units in your answer.
12. The diagonal of a rectangle measures 25 cm. The width of the rectangle is 7 cm. Find the length of the rectangle. Omit the units in your answer.
13. The length of a rectangle measures 40 meters. The width of the rectangle is 9 meters. Find the length of the diagonal of the rectangle. Omit the units in your answer.
14. Kathy is flying a kite on 100 feet of string. How high is it above her hand (vertically) if the horizontal distance between Kathy and the kite is 60 feet? Assume that the string of the kite is the hypotenuse of a right triangle! Omit the units in your answer.

SOLUTIONS

- | | | | |
|--------------------------|---------|----------------------------|----------|
| 1a. isosceles | | 2a. scalene | |
| 1b. scalene, right angle | | 2b. equilateral | |
| 1c. isosceles | | 2c. scalene, right angle | |
| 1d. equilateral | | 2d. equilateral | |
| 1e. scalene | | 2e. scalene | |
| 1f. isosceles | | 2f. isosceles, right angle | |
| 1g. equilateral | | 2g. scalene | |
| 1h. isosceles | | 2h. isosceles | |
| 3. 13.9 | 4. 11.4 | 5. 11.3 | 6. 8.5 |
| 7. 12.6 | 8. 5.7 | 9. 16.1 | 10. 14.8 |
| 11. 8 | 12. 24 | 13. 41 | 14. 80 |

Period 28: An Introduction to some Trigonometric Ratios

Cleaves and Hobbs College Mathematics: Ch 20, Sec 1, Learning Outcomes (LO) 1- 3

Homework: Pages 808-809, # 1-53

Period 29: Significant Digits

Do the following exercises:

Determine the number of significant digits for the following numbers.

- | | | | |
|--------------|-------------|-------------|-------------|
| 1. 812 | 2. 7.139 | 3. 14.3005 | 4. 9.300 |
| 5. 0.008 | 6. 23,000 | 7. 3.905 | 8. 3.950 |
| 9. 83.693 | 10. 147.005 | 11. 147.500 | 12. 7.004 |
| 13. 0.004 | 14. 0.00187 | 15. 1.00187 | 16. 8.020 |
| 17. 0.020 | 18. 8,603.0 | 19. 8,600 | 20. 0.01040 |
| 21. 95,080.7 | 22. 2.0378 | 23. 0.0378 | 24. 123.10 |
| 25. 0.090 | 26. 9,709.3 | 27. 9,700 | 28. 12.090 |

Round each of the following numbers to three (3) significant digits.

- | | | | |
|-----------|-----------|-------------|-------------|
| 29. 768.7 | 30. 921.3 | 31. 12.53 | 32. 28.17 |
| 33. 9.003 | 34. 1.700 | 35. 7.125 | 36. 93.75 |
| 37. 11.55 | 38. 9.155 | 39. 0.02356 | 40. 0.03789 |

Round each of the following numbers to two (2) significant digits.

- | | | | |
|-----------|-----------|-------------|-------------|
| 41. 768.7 | 42. 921.3 | 43. 12.53 | 44. 28.17 |
| 45. 9.003 | 46. 1.700 | 47. 7.125 | 48. 93.75 |
| 49. 11.55 | 50. 9.155 | 51. 0.02356 | 52. 0.03789 |

SOLUTIONS

- | | | | |
|----------|----------|------------|------------|
| 1. 3 | 2. 4 | 3. 6 | 4. 4 |
| 5. 1 | 6. 2 | 7. 4 | 8. 4 |
| 9. 5 | 10. 6 | 11. 6 | 12. 4 |
| 13. 1 | 14. 3 | 15. 6 | 16. 4 |
| 17. 2 | 18. 5 | 19. 2 | 20. 4 |
| 21. 6 | 22. 5 | 23. 3 | 24. 5 |
| 25. 2 | 26. 4 | 27. 2 | 28. 5 |
| 29. 769 | 30. 921 | 31. 12.5 | 32. 28.2 |
| 33. 9.00 | 34. 1.70 | 35. 7.13 | 36. 93.8 |
| 37. 11.6 | 38. 9.16 | 39. 0.0236 | 40. 0.0379 |
| 41. 770 | 42. 920 | 43. 13 | 44. 28 |
| 45. 9.0 | 46. 1.7 | 47. 7.1 | 48. 94 |
| 49. 12 | 50. 9.2 | 51. 0.024 | 52. 0.038 |

Period 30: Solving Right Triangles

Cleaves and Hobbs College Mathematics: Ch 20, Sec 2, Learning Outcomes (LO) 1- 5

Homework: Pages 820 - 823, # 1-42, 48, 50, 51

Period 31: Review for Test 4 (Optional)

Period 32: Test 4