Intermediate Algebra Syllabus Spring 2012
Math 101 Section ---------

Instructor: ---------------  Email: ---------------  Office: ---------------

Phone: ---------------  Office hours: ---------------

Micheal Sullivan, K. R. Struve, J. Mazzarella. This is a custom edition bundled especially for MATH 101 Intermediate
Algebra at UMES. Packaged materials include the course text and MyMathLabsPlus Student Access Kit. Before
purchasing used materials, students are advised that the access code to MyMathLabsPlus included with the text purchase
is required for the course and is nontransferable.

Course Description:
Topics in this intermediate algebra course include the algebra of signed numbers, solving linear equations and
inequalities, quadratic equations, operations on algebraic expressions, and graphing. This course does not satisfy the
General Education Requirement in Mathematics.

Course Outcomes:
1. Use a problem solving approach to investigate and understand mathematical content.
2. Use mathematical vocabulary, notation, and structure to represent ideas, describe relationships, and model situations.
3. Read and write presentations of mathematics with understanding.
4. Use and analyze algorithms.
5. Apply mathematical content and processes to model and solve problems from situations within and outside
   mathematics.
6. Develop understanding of and appreciation for biographical and historical development of mathematics.

Nature of the Course:
Intended as a developmental mathematics course, Intermediate Algebra offers students opportunities to refine and extend
their understanding of mathematics content requisite to college level mathematics. The course has been designed to take
full advantage of current instructional technologies including computer assisted instruction and web-based support.
Students are encouraged to utilize every opportunity available through this course to increase their confidence and fluency
with electronic media.

Special Rules:
1. No eating or drinking during class.
1. No cell phone usage during class

General Reminders for Students:
   ➢ Students whose names do not appear on the official class roster will not be allowed to attend the class.

   ➢ A grade of “I” will not be given to students who have a failing grade going into the finals.
**HOMEWORK and QUIZZES:**
Homework and quizzes are assigned regularly on the MyMathLabsPlus site. *All* homework problems are to be worked with paper and pencil in your Math notebook and they are graded.

**Arithmetic Skills Test (I:\bird\apps\math101)**

Successful completion (14 correct out of 20) of the Arithmetic Skills Test is required for students to receive a passing grade in Intermediate Algebra. The Arithmetic Skills Test will be administered by each instructor periodically (at least three times) throughout the semester. The Arithmetic Skills Practice Test is available on-line for all sections of Intermediate Algebra. Students are encouraged to access the Arithmetic Skills Practice Test early in the semester. Students who do not pass the Arithmetic Skills Test will be required to submit a printed hardcopy of the Arithmetic Skills Practice Test to their instructor once each week until the next administration of the Arithmetic Skills Test. Students who fail to complete this requirement will not be permitted admittance to subsequent administrations of the Arithmetic Skills Test. Students who do not pass the AST in three administrations will receive a grade of “I” for the course (provided that all other course components reflect a grade of C or better).

**Course Requirements:**

Students who attend class regularly, complete assignments religiously, and utilize the support resources available may expect to perform well on course quizzes, tests, and examinations. Consequently, they may expect to complete the course successfully.

Students in MATH 101 are expected to take full advantage of technology-base learning opportunities available through this course. Required homework, and quizzes will be assigned, evaluated, and recorded on-line. Upon registration for this class, students receive two weeks free access to MyMathLabsPlus. However, a personal access code to this website must be purchased before this guest access expires (buy stand-alone code online). One-time-use access codes are provided with the purchase of the required text. Students are advised to weight the costs to acquire valid access codes against potential savings before purchasing used courseware.

Students will be required to maintain a notebook to document progress and organize materials. Students are expected to bring the notebook to class daily. Students will access homework assignments, quizzes, and some tests through MyMathLabsPlus. The software provides problems and support, students input solutions, and the software provides feedback. Students are expected to maintain handwritten records of the problems as well as detailed solutions. Instructors as well as tutors will need these when providing students with assistance.

**Registration Policy:**

Consistent with University policy unregistered students are not permitted attendance. Students are reminded that neither Intermediate Algebra instructors nor the Course Coordinator will seek variations to University registration policy including add/drop procedures under any circumstances. Students are strongly encouraged to consult the UMES Academic Calendar for important dates including add/drop and withdraw dates.

**Support Services:**

At the first sign of difficulty, students are encouraged to seek assistance from their instructor during posted office hours. Instructors will be able to broker a variety of interventions including direct assistance as well as tutoring available through the Department of Mathematics and Computer Science, the Office of Retention, and the Student Development Center.
Study Habits:

As a rule of thumb, undergraduate students can be expected to devote three (3) hours coursework outside of class for every hour they spend in class. Intermediate Algebra is a three credit hour course. Consequently, students should expect that they will spend at least 1½ hours for each of 6 days a week. The course coordinator has arranged for daily homework and quizzes accordingly. Those students who struggle with mathematics should prepare to devote additional time. All students are encouraged to make a schedule of their activities for the week. The weekly schedule printed from HAWK Web is a good place to start. In addition to class times, students should consider work study hours and time for sleep, meals, exercise, and other important activities. Finally, students should add an uninterrupted time block of 1½ hours that will be devoted to the study of mathematics. Conventional wisdom supports that students who commit their schedules to paper are much more likely to devote the necessary time to their studies and are generally more successful academically.

Attendance:

Instructors will take attendance each day in each section of Intermediate Algebra. Absences will be reported monthly to the Course Coordinator and to the Office of Retention. The role will be taken at the beginning of each class. Students must be in class when their name is call to be considered in attendance. Tardiness will not be tolerated. Attendance is also considered as an important element of the course evaluation. Attendance grades will be calculated as a simple percentage of the total number of classes. In the event emergencies students are responsible to provide documentation (e.g. note from Student Health Services) for an absence to be excused. Students are still responsible for the material covered in the class (es) that are missed. A copy of the university Attendance Policy is attached to this syllabus.

Examinations:

Times and dates for examinations are indicated on this syllabus. Students are encouraged to observe these important dates and arrange out of class activities around them. Opportunities for make-up examinations will not be provided. In the event of a documented obligation that prevents attendance for a test (including participating on athletic events or other University-sponsored activity), the test may be taken prior to the scheduled date if the student provides the Course Coordinator with written notice 72 hours in advance of the examination. Students are advised to make careful notice of the final examination schedule provided by the University and plan their end of semester activities accordingly. The common final examination is scheduled for all Math 101 classes. No opportunities to write the final examination other than at time as established by the University Office of Academic Affairs will be provided under any circumstances.

Precautionary Disclaimer:

The instructor reserves the right to amend the course syllabus during the term. If changes must be made, students will be notified. Notice given during class is considered proper notice. Office hours are subject to change depending on the instructor’s schedule.

Instructions for student athletes:

Any student athlete (or participant of other University activities) enrolled in class must make an appointment within the first week of the semester to meet with the instructor so that game schedules and travel schedules can be discussed and the instructor can clarify for the athlete procedures and policy on make-up work. Student athletes are reminded that absences (whether excused or unexcused) do not relieve them of their responsibility to complete course assignments. Instructors must know in advance that absences related to athletic events will occur so that early planning can take place. (See attached policy on class attendance).

FINAL EXAM: 8:00-9:50 A.M. on May 14, 2012
Grade Determination:

Final grades will be computed using the following formula:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Homework</td>
<td>15%</td>
</tr>
<tr>
<td>Quizzes</td>
<td>15%</td>
</tr>
<tr>
<td>Attendance and participation</td>
<td>10%</td>
</tr>
<tr>
<td>In-class hourly Tests</td>
<td>40%</td>
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<tr>
<td>Final examination</td>
<td>20%</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Range of Scores</th>
<th>Letter Grade</th>
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<tbody>
<tr>
<td>90 - 100</td>
<td>A</td>
</tr>
<tr>
<td>80 - 89</td>
<td>B</td>
</tr>
<tr>
<td>70 - 79</td>
<td>C</td>
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<td>60 - 69</td>
<td>D</td>
</tr>
<tr>
<td>Below</td>
<td>F</td>
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University Dress Code

Students are expected to exercise good judgment concerning appropriate dress for the classroom. Dressing appropriately in an environment that is conducive to learning requires that clothing not be distracting and is sufficient in quality and quantity to cover and protect the body (particularly in laboratories). Individual freedom of dress is upheld at UMES, but students should be respectful of sensitivities of others and recognize that dressing professionally is a part of training that UMES desires to provide. Attire that is more appropriate for the bedroom or night clubs should not be worn in the classrooms, as such may be distracting or offensive to others.

Academic Honesty

Students are expected to secure, read, and understand their rights and responsibilities relative to academic honesty under the UMES Student Code of Conduct: Student Judiciary Manual (http://www.umes.edu/students/UMESStudentCode2003.pdf). Students who cheat by violating the integrity of testing situations, copying the work of others, or representing as their own work that they did not actually do will result in a zero grade. Of course, students may appeal the decision of their instructor. This will require the instructor to register the incident formally to the Office of the Vice President for Student Affairs in accordance with established University policy and procedure.

Student Professional Code of Conduct

This Student Code of Conduct was created to support a productive and stimulating learning environment in all School of Business and Technology classes. The code is designed to help ensure a positive atmosphere for the vast majority of students who currently exhibit the professional standards detailed below.

- Students should exhibit **professional classroom values and behavior** by:
  - Engaging in appropriate communication and interaction.
  - Demonstrating trust, respect and civilities.
  - Approaching course content as important and necessary for success in business.
  - Engaging in responsible classroom activities such as:
    - turning off cell phone ringers
    - avoiding unnecessary talking
    - not reading outside material or doing other work during class

- Students should contribute to a **positive learning environment** by:
  - Arriving, attending, and departing class in a professional manner.
  - Taking responsibility for team and individual assignments.
Developing cooperative relationships with other students and faculty.

- Students should support a **professional environment** within the School of Business and Technology by:
  - Avoiding inappropriate language in and near classrooms and offices.
  - Refraining from unrealistic expectations in dealing with administration, faculty, and staff.

- Students must uphold the **academic integrity** standards as explained in the university’s *on-line Undergraduate Catalog*. Academic integrity is conceptualized as doing and taking credit for one’s own work. Violations of the university’s academic integrity standards include, but are not limited to:
  - **Cheating in the classroom.** Cheating includes using unauthorized sources of information and providing or receiving unauthorized assistance on any form of academic work.
  - **Plagiarism.** Plagiarism includes the copying of language, structure, ideas, or thoughts of another, and representing them as one’s own without proper acknowledgment.
  - **Unauthorized Possession or Disposition of Academic Materials.** Unauthorized possession or disposition of academic materials includes the unauthorized selling or purchasing of examinations or other academic work; stealing another student’s work; unauthorized entry to or use of material in a computer file; theft or mutilation of library materials; and using information from or possessing exams that an instructor did not authorize for release to students.
  - **Falsification.** Falsification encompasses any untruth, either verbal or written, in one’s academic work.
  - **Facilitation of Cases of Academic Dishonesty.** Facilitation of any act of academic dishonesty including cheating, plagiarism, and/or falsification of documents also constitutes violation of the university’s academic integrity.

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**UMES Policy for Class Attendance**

1. The University expects all students to take full responsibility for their academic work and progress. All students must meet qualitative and quantitative requirements of each course in their curricula to progress satisfactorily. They are expected to attend classes regularly, for consistent attendance offers the most effective opportunity open to all students to gain command of the concepts and materials for their courses of study. Absences (whether excused or unexcused) do not alter what is expected of students qualitatively or quantitatively.

2. In many courses, in-class participation is an essential part of the work of the course, such as courses requiring group discussion, laboratories, clinics, public speaking or language conversation, or performance of particular skills. In other courses, occasional in-class assessments may occur, without prior notice.

3. The University will excuse absences of students that result from instances such as: illness (where the student is too ill to attend class), death in the immediate family, religious observance (where the nature of the observance prevents the student from being present during the class period), participation in University activities at the request of the University authorities, and compelling circumstances beyond the student’s control. Students requesting excused absences must furnish acceptable documentation to their course instructors to support their assertions that absences were the result of one of these causes. However, the nature of some courses will preclude makeup of assessments missed. In these cases, students will not be penalized for excused absences; grades will be computed on actual assessments as explained in the course syllabus. Otherwise, students with excused absences will be given an opportunity to make up missed assessments. The responsibility for granting excused absences and determining which assessments can be made up lies with the instructor of each individual course. Absences (whether excused or unexcused) do not relieve the students of their responsibility to complete the course assessments. Instructors are especially understanding in cases related to health and/or death, provided the student provides proper documentation.

4. Students must notify their instructors of the reason for any absences as soon as possible. When the reason for an absence is known in advance (for example, in cases of religious observance or participation in University activities at the request of University authorities), students must inform their instructors two weeks prior to the absence, if known that far in advance or immediately upon discovering the impending absence. Prior notification is particularly important in connection with examinations and other major assessments since failure to reschedule them before conclusion of the final examination period may result in loss of credits during the semester. Where the reason is not known in advance (for
example in cases of health related emergencies or compelling circumstances beyond their control), students must inform their instructors as soon as possible after its development.

5. In cases of dispute, the student may appeal to the chair of the department offering the course within one week from the date of the refusal of the right to make-up assessment. In those cases where the instructor is the chair, the appeal may be made to the dean. The dean’s decision will be final in all cases. When permitted, a make-up assessment must be given on campus unless the published schedule or course description requires other arrangements. The make-up assessment must be held at a time and place mutually agreeable to both the instructor and the student. The make-up assessment must not interfere with the student’s regularly scheduled classes. In the event that a group of students requires the same make-up assessment, one make-up assessment time may be scheduled at the convenience of the instructor and the largest possible number of students involved, and a second make-up for the remaining group.

6. All students are expected to attend all classes. Excessive unexcused absences for any reason may result in either a low grade or course failure. All students will be considered excessively absent from a class if they miss a class more hours during the semester or term than the class meets each week. For example, a student should not miss (unexcused absences) a class that meets three hours per week more than three hours during the semester or term nor be absent from a class that meets one hour per week more than once during the semester or term.
Properties of Real Numbers

Linear Equations in One Variable

Introduction to Problem Solving

Formulas and Problem Solving

Compound inequalities
Absolute Value Inequalities
Graphing Equations
Introduction to Functions

Graphing Linear Functions
Slope of a Line
Graphing Linear Inequalities
Exponents and Scientific Notation
More Work with Exponents and Scientific Notation
Radicals and Radical Functions
Rational Exponents
Multiplying Polynomials
Factoring Trinomials
Factoring by Special Products
Solving Equations by Factoring and Problem Solving
Solving Quadratic Equations by Completing the Square
Solving Quadratic Equations by the Quadratic Formula
Rational Functions and Multiplying and Dividing Rational Expressions
Adding and Subtracting Rational Expressions
Simplifying Complex Fractions
Dividing Polynomials
Solving Equations Containing Rational Expressions
Rational Equations and Problem Solving
Sample Test
Name___________________________________

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Find the value of the algebraic expression at the given replacement value.

1) \(4x - y \) when \(x = 9\) and \(y = 2\)
   
   A) 72  
   B) 34  
   C) 6  
   D) 38

2) \(t + 0 = \) _______  Additive identity property
   
   A) 0  
   B) 1  
   C) \(0 + t\)  
   D) \(t\)

Simplify the expression.

3) \(\frac{29 - (-1)}{-5} \)
   
   A) 5  
   B) -6  
   C) 6  
   D) -5

Write the sentence using mathematical symbols.

4) The sum of -19 and \(x\) is -20.
   
   A) -19 + \(x\) = -20  
   B) \(x\) = -19 + 20  
   C) \(x\) - 20 = -19  
   D) -19 - 20 = \(x\)

Write the following as an algebraic expression.

5) If 6\(x\) is an even integer, represent the next even integer as an expression in \(x\).
   
   A) 6\(x\) + 1  
   B) 8\(x\)  
   C) 12\(x\)  
   D) 6\(x\) + 2

Write the solution set using interval notation.

6) \(\frac{1}{8} (10x - 64) \geq x - 4 \)
   
   A) \((\infty, 16)\)  
   B) \([16, \infty)\)  
   C) \((16, \infty)\)  
   D) \((\infty, 16]\)

Solve the absolute value equation.

7) \(|5x + 4| + 10 = 8\)
   
   A) \(\frac{2}{5}, \frac{6}{5}\)  
   B) \(\frac{2}{5}, \frac{6}{5}\)  
   C) \(\frac{1}{2}, \frac{3}{2}\)  
   D) \(\emptyset\)

8) \(|10x| = 39\)
   
   A) 0, 3.9, -3.9  
   B) -3.9  
   C) 3.9  
   D) 3.9, -3.9

Solve the equation.

9) \(x - 16.3 = -12.4\)
   
   A) 3.9  
   B) 28.7  
   C) -28.7  
   D) -3.9

Solve.

10) Cindy has scores of 71, 84, 83, and 89 on her biology tests. Use a compound inequality to find the range of scores she can make on her final exam to receive a C in the course. The final exam counts as two tests, and a C is received if the final course average is from 70 to 79.
   
   A) 70 \leq \text{final score} \leq 79  
   B) 11.5 \leq \text{final score} \leq 34  
   C) 93 \leq \text{final score} \leq 147  
   D) 46.5 \leq \text{final score} \leq 73.5

Determine whether the equation is linear or not.

11) \(y = 8x^2\)
A) linear
B) not linear

Use the slope-intercept form of the linear equation to write the equation of the line with the given slope and y-intercept.

\[ \text{Slope } \frac{5}{3}; \text{ y-intercept } (0, 0) \]
A) \( y = \frac{5}{3} \)  
B) \( y = -\frac{5}{3}x \)  
C) \( y = \frac{5}{3}x \)  
D) \( y = -\frac{5}{3} \)

Find the domain and the range of the relation. Then determine whether the relation is a function.

13) \{(-2, -7), (0, 3), (3, -4), (7, -1)\}

A) domain: \{-7, 3, -4, -1\}  
B) domain: \{-2, 0, 3, 7\}  
C) domain: \{-2, 0, 3, 7\}  
D) domain: \{-7, 3, -4, -1\}

range: \{-2, 0, 3, 7\}  
range: \{-7, 3, -4, -1\}
function  
not a function

Find the domain and the range of the relation. Use the vertical line test to determine whether the graph is the graph of a function.

14)

A) domain: \{3\}  
B) domain: \((-\infty, \infty)\)  
C) domain: \((-\infty, \infty)\)  
D) domain: \{3\}
range: \((-\infty, \infty)\)  
range: \{3\}  
range: \{3\}  
range: \((-\infty, \infty)\)
function  
not a function  
function  
not a function

Graph the inequality.

15) \( y \geq -3x \)

A)
16) If \( Q(x) = x^2 - 5 \), find \( Q(-5) \).
   A) 100  B) -10  C) 20  D) 25

17) \( x^2 - 81 \)
   A) \((x + 9)^2\)  B) \((x - 9)^2\)  C) \((x + 9)(x - 9)\)  D) prime polynomial

18) \( 25x^{2n} - 49 \)
   A) \((5^n x + 7)(5^n x - 7)\)  B) \((5^n x + 7)^2\)  C) \((5^n x - 7)^2\)  D) prime polynomial

19) \( 12(a + 3)^2 + 31(a + 3) + 20 \)
   A) \((4a + 5)(3a + 4)\)  B) \((4a + 8)(3a + 7)\)  C) \((4a + 17)(3a + 13)\)  D) \((4a + 16)(3a + 14)\)

20) Simplify. Write the answer with positive exponents.
   A) \(y^3 - y^2\)  B) \(y\)  C) \(y^5\)  D) \(\frac{1}{y}\)
Simplify.

21) \[\frac{25t^2 - 6s^2}{st} - \frac{5}{s} \cdot \frac{8}{t}\]

A) \(\frac{8s + 5t}{st}\)  
B) \(5s + 8t\)  
C) \(\frac{st}{5s + 8t}\)  
D) \(8s + 5t\)

Solve the equation for the specified variable.

22) \(P = \frac{A}{1 + rt}\) for \(t\)

A) \(t = \frac{P - A}{1 + r}\)  
B) \(t = \frac{A - P}{Pr}\)  
C) \(t = P - rA\)  
D) \(t = \frac{P - 1}{Ar}\)

Simplify the rational expression.

23) \(\frac{x^2 - xy + 11x - 11y}{x + 11}\)

A) \(x - 2y + 1\)  
B) \(\frac{1}{x + 11}\)  
C) \(x - y\)  
D) \(\frac{x^2 - xy + 11x - 11y}{x + 11}\)

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Fill in the blank with one of the words or phrases listed below.

rational expression  long division  opposites  jointly
least common denominator  expression  directly  inversely
synthetic division  complex fraction  equation

24) The ____________ of a list of rational expressions is a polynomial of least degree whose factors include the denominator factors in the list.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Solve.

25) The amount of paint needed to cover the walls of a room varies jointly as the perimeter of the room and the height of the wall. If a room with a perimeter of 40 feet and 8-foot walls requires 3.2 quarts of paint, find the amount of paint needed to cover the walls of a room with a perimeter of 55 feet and 6-foot walls.

A) 330 quarts  
B) 33 quarts  
C) 6.6 quarts  
D) 3.3 quarts

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Fill in the blank with one of the words or phrases listed below.

index  rationalizing  conjugate
principal square root  cube root  complex number
like radicals  imaginary unit  radicand

26) The ____________ of a number is written as \(\sqrt[n]{a}\).
27) \(3\sqrt{5} \cdot 3\sqrt{25}\) 
A) 5 \hspace{1cm} B) \(\frac{3}{5}\sqrt{5}\) \hspace{1cm} C) 25 \hspace{1cm} D) 125

28) \(\frac{3\sqrt[3]{343}}{\sqrt[3]{512}}\) 
A) -56 \hspace{1cm} B) 56 \hspace{1cm} C) -1 \hspace{1cm} D) 15

Use radical notation to write the expression. Simplify if possible.

29) \(243\sqrt[4]{5}\) 
A) 2187 \hspace{1cm} B) 81 \hspace{1cm} C) 6561 \hspace{1cm} D) 19,683

Multiply, and then simplify if possible. Assume all variables represent positive real numbers.

30) \((\sqrt[7]{7} + 2)(\sqrt[7]{7} - 2)\) 
A) 11 \hspace{1cm} B) 3 \hspace{1cm} C) 5 \hspace{1cm} D) 7 - 2\sqrt[7]{7}

Solve the inequality. Graph the solution set and write the solution set in interval notation.

31) \(4x^3 + 24x^2 - 9x - 54 > 0\)
A) \((-\infty, -6) \cup (-2, \infty)\)
B) \((-\infty, -6) \cup (-2, \infty)\)
C) \((-6, -2) \cup (\infty, \infty)\)
D) \([-6, -2] \cup [2, \infty)\)

32) \((4x - 1)(x + 2) \leq 0\)
A) \((-\infty, -2] \cup [\frac{1}{4}, \infty)\)
B) \((-\infty, \frac{1}{4}]\)
Use the discriminant to determine the number and type of solutions of the equation.

33) \( x^2 - 6x + 9 = 0 \)

A) two complex but not real solutions  
B) two real solutions  
C) one real solution

Add the proper constant to each binomial so that the resulting trinomial is a perfect square trinomial. Then factor the trinomial.

34) \( x^2 - \frac{13}{13} x + \) 

A) \( \frac{2}{13} x^2 - \frac{2}{13} x + \frac{2}{169} = \left( x - \frac{1}{13} \right)^2 \)  
B) \( x^2 - \frac{2}{13} x + \frac{1}{169} = \left( x + \frac{1}{13} \right)^2 \)  
C) \( \frac{2}{13} x^2 - \frac{1}{13} x + \frac{1}{169} = \left( x - \frac{1}{13} \right)^2 \)  
D) \( x^2 - \frac{2}{13} x + \frac{4}{169} = \left( x - \frac{2}{13} \right)^2 \)

Use the square root property to solve the equation.

35) \( x^2 = 36 \)

A) 6  
B) 18  
C) -7, 7  
D) -6, 6

1) B  
2) D  
3) B  
4) A  
5) D  
6) B
7) D
8) D
9) A
10) D
11) B
12) C
13) C
14) C
15) B
16) C
17) C
18) A
19) C
20) B
21) D
22) B
23) C
24) least common denominator
25) D
26) cube root
27) A
28) B
29) B
30) B
31) C
32) D