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INSTITUTE FOR THE PROFESSIONAL
DEVELOPMENT OF ADULT EDUCATORS

Algebra Resources

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BY EDUCATORS FOR EDUCATORS

About IPDAE

Math Resources

Prealgebra and Beginning Algebra

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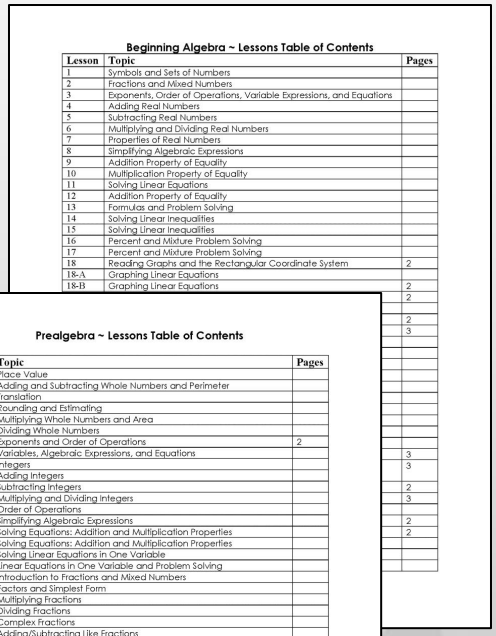
IRSC Professor and Department Chair

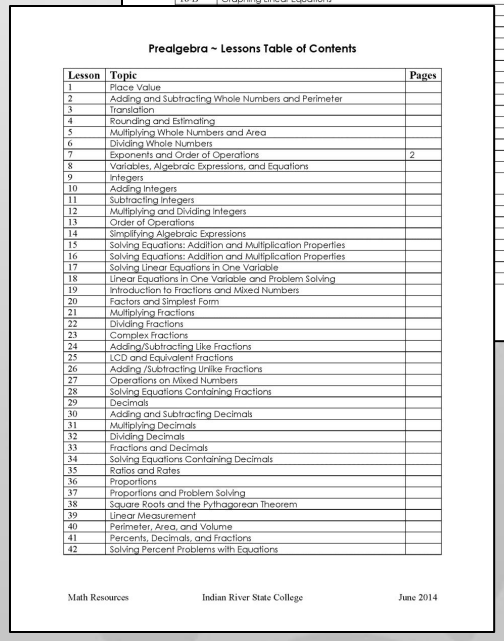
Resources for algebra

- Handouts with Instructional Videos
- Topics from *Place Value* to *Solving Quadratic Equations*
- Available online as PDF files
- Short, interactive, and focused



Beginning Algebra ~ Lessons Table of Contents

Lesson	Topic	Pages
1	Symbols and Sets of Numbers	
2	Fractions and Mixed Numbers	
3	Exponents, Order of Operations, Variable Expressions, and Equations	
4	Adding Real Numbers	
5	Subtracting Real Numbers	
6	Multiplying and Dividing Real Numbers	
7	Properties of Real Numbers	
8	Simplifying Algebraic Expressions	
9	Addition Property of Equality	
10	Multiplication Property of Equality	
11	Solving Linear Equations	
12	Addition Property of Equality	
13	Formulas and Problem Solving	
14	Solving Linear Inequalities	
15	Solving Linear Inequalities	
16	Percent and Mixture Problem Solving	
17	Percent and Mixture Problem Solving	
18	Reading Graphs and the Rectangular Coordinate System	2
18-A	Graphing Linear Equations	
18-B	Graphing Linear Equations	2
		2
		2
		3



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1	Place Value	
2	Adding and Subtracting Whole Numbers and Perimeter	
3	Translation	
4	Rounding and Estimating	
5	Multiplying Whole Numbers and Area	
6	Dividing Whole Numbers	
7	Exponents and Order of Operations	2
8	Variables, Algebraic Expressions, and Equations	3
9	Integers	3
10	Adding Integers	
11	Subtracting Integers	2
12	Multiplying and Dividing Integers	3
13	Order of Operations	
14	Simplifying Algebraic Expressions	2
15	Solving Equations: Addition and Multiplication Properties	2
16	Solving Equations: Addition and Multiplication Properties	
17	Solving Linear Equations in One Variable	
18	Linear Equations in One Variable and Problem Solving	
19	Introduction to Fractions and Mixed Numbers	
20	Factors and Simplest Form	
21	Multiplying Fractions	
22	Dividing Fractions	
23	Complex Fractions	
24	Adding/Subtracting Like Fractions	
25	LCD and Equivalent Fractions	
26	Adding /Subtracting Unlike Fractions	
27	Operations on Mixed Numbers	
28	Solving Equations Containing Fractions	
29	Decimals	
30	Adding and Subtracting Decimals	
31	Multiplying Decimals	
32	Dividing Decimals	
33	Fractions and Decimals	
34	Solving Equations Containing Decimals	
35	Ratios and Rates	
36	Proportions	
37	Proportions and Problem Solving	
38	Square Roots and the Pythagorean Theorem	
39	Linear Measurement	
40	Perimeter, Area, and Volume	
41	Percents, Decimals, and Fractions	
42	Solving Percent Problems with Equations	

Math Resources Indian River State College June 2014

"In order to learn,
one must notice something."

Miller, N. E. (1957). Graphic communication and the crisis in education.
Audio Visual Communication Review, 5(3), 3-59.

Complete Lessons:

42 lessons for Prealgebra
44 lessons for Beginning Algebra

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19	Intercepts	
20	Slope Intercept Form	2
21	Slope Intercept Form	3
22	Slope and Rate of Change	
23	Proportion and Proportion Applications	
24	Exponents	
25	Negative Exponents and Scientific Notation	
26	Adding and Subtracting Polynomials	
27	Multiplying Polynomials	
28	Special Products	
29	Dividing Polynomials	
30	GCF	
31	The GCF and Factoring by Grouping	
32	Factoring Trinomials of the form $x^2 + bx + c$	3
33	Factoring Trinomials of the form $ax^2 + bx + c$ and Perfect Square Trinomials	3
34	Factoring Binomials	2
35	Factoring Binomials (Cubes)	3
36	Solving Quadratic Equations by Factoring	
37	Simplifying Rational Expressions	2
38	Multiplying and Dividing Rational Exp.	2
39	Introduction to Radicals	
40	Simplifying Radicals	
41	Adding and Subtracting Radicals	

What does a lesson look like?

Handout: PDF

Beginning Algebra ~ Lesson 23
Work the following examples as you listen to the recorded lecture.

Proportion Problems

Remember:
Proportion problems look like a fraction equal to another fraction
Solve proportions by cross multiplying.
Do not confuse proportions with multiplying fractions. When multiplying fractions, you cross reduce. When solving proportions, you cross multiply.

Example 1: $\frac{16}{20} = \frac{z}{35}$

Example 2: $\frac{12}{10} = \frac{x}{16}$

Example 3: $\frac{n}{0.6} = \frac{0.05}{12}$

Example 4: $\frac{12}{\frac{3}{4}} = \frac{48}{n}$

Example 5: $\frac{x+1}{3x-4} = \frac{3}{8}$

Example 6: $\frac{11x+2}{3} = \frac{10x-5}{2}$

Video: Interactive PDF

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Example 1: $\frac{16}{20} = \frac{z}{35}$

$5z = 4 \cdot 35$

$\frac{5z}{5} = \frac{140}{5}$

$z = 28$

Example 2: $\frac{12}{10} = \frac{x}{16}$

$5x = 6 \cdot 16$

$\frac{5x}{5} = \frac{96}{5}$

$x = \frac{96}{5}$

Example 3: $\frac{n}{0.6} = \frac{0.05}{12}$

$12n = (.6)(.05)$

$\frac{12n}{12} = \frac{.03}{12}$

$n = .0025$

Example 4: $\frac{12}{\frac{3}{4}} = \frac{48}{n}$

$12n = \frac{3}{1} \cdot \frac{48}{1}$

$\frac{12n}{12} = \frac{36}{12}$

$n = 3$

Example 5: $\frac{x+1}{3x-4} = \frac{3}{8}$

$8(x+1) = 3(3x-4)$

$8x + 8 = 9x - 12$

$-8x \quad -8x$

$8 = x - 12$

$+12 \quad +12$

$20 = x$

Example 6: $\frac{11x+2}{3} = \frac{10x-5}{2}$

$3(10x-5) = 2(11x+2)$

$30x - 15 = 22x + 4$

$-22x \quad -22x$

$8x - 15 = 4$

$+15 \quad +15$

$\frac{8x}{8} = \frac{19}{8}$

$x = \frac{19}{8}$

So, How does it work?

- Print the lesson handout
- Take notes and work problems while watching the video instruction
- Video provides audio explanation with "board work" –just like writing on a whiteboard in front of a class – but allows student control and setting/time selection
- “Completed” videos can also be printed

Video Demonstration

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Example 1: $\frac{16}{20} = \frac{z}{35}$

$5z = 140$

$z = 28$

Example 2: $\frac{12}{10} = \frac{x}{16}$

$5x = 96$

$x = \frac{96}{5}$

Example 3: $\frac{n}{0.6} = \frac{0.05}{12}$

$12n = .03$

$n = .0025$

Example 4: $\frac{12}{\frac{3}{4}} = \frac{48}{n}$

$12n = 36$

$n = 3$

Example 5: $\frac{x+1}{3x-4} = \frac{3}{8}$

$8x + 8 = 9x - 12$

$20 = x$

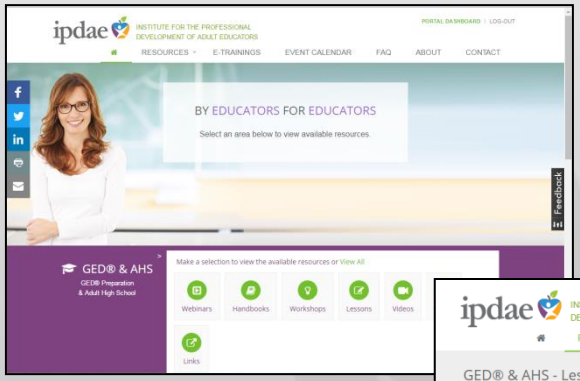
Example 6: $\frac{11x+2}{3} = \frac{10x-5}{2}$

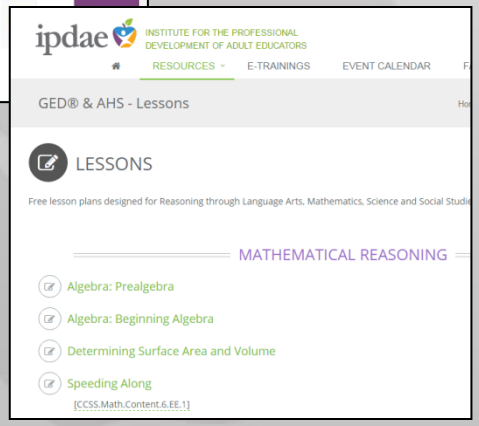
$30x - 15 = 22x + 4$

$8x = 19$

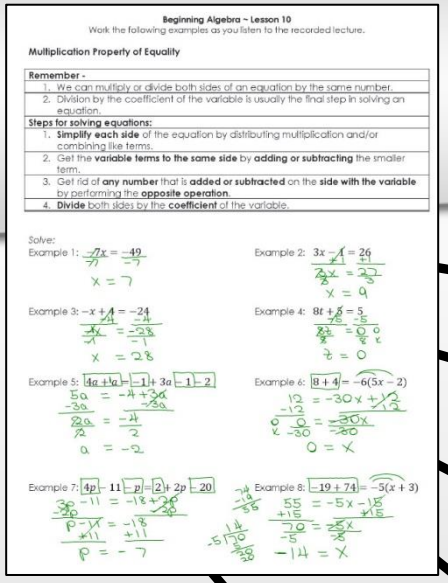
$x = \frac{19}{8}$

- Floridaipdae.org
  - GED & AHS
    - Lessons





How are these resources used?



Beginning Algebra ~ Lesson 10
Work the following examples as you listen to the recorded lecture.

Multiplication Property of Equality

Remember -
1. We can multiply or divide both sides of an equation by the same number.
2. Division by the coefficient of the variable is usually the final step in solving an equation.

Steps for solving equations:
1. **Simplify each side** of the equation by distributing multiplication and/or combining like terms.
2. Get the **variable terms to the same side** by **adding or subtracting** the smaller term.
3. Get rid of **any number** that is **added or subtracted** on the **side with the variable** by performing the **opposite operation**.
4. **Divide** both sides by the **coefficient** of the variable.

Solve:
Example 1: $\frac{-7x}{-7} = \frac{-49}{-7}$, $x = 7$
Example 2: $3x - 1 = 26$, $3x = 27$, $x = 9$
Example 3: $-x + 4 = -24$, $-x = -28$, $x = 28$
Example 4: $8t + 5 = 5$, $8t = 0$, $t = 0$
Example 5: $4a + a - 1 + 3a - 1 - 2$, $5a = -4 + 3a$, $2a = -4$, $a = -2$
Example 6: $8 + 4 = -6(5x - 2)$, $12 = -30x + 12$, $0 = -30x$, $0 = x$
Example 7: $4p - 11 - p - 2 + 2p - 20$, $p - 11 = -18$, $p = -7$
Example 8: $-19 + 74 = -5(x + 3)$, $55 = -5x - 15$, $70 = -5x$, $-14 = x$

Supplemental

When students need a little extra help understanding or remembering

Flipping

Introduce students to material before they come to class

Student Review

Quick student review of important procedures and concept

Backup

>Absent

>Hospital/homebound

>Alternative Schools

Teacher Support

Brush up on unfamiliar topics, procedures, and concepts

Prepare students for college math!

Contact information:

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