

Lesson 3 – 1.6/1.7 – Linear Equations & Inequalities

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Lesson Objectives

- ▶ Write and solve linear equations in one variable
- ▶ Write, solve, and graph linear inequalities in one variable

▶ 2

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Fast Five

- ▶ EXPLAIN to your table partners, 3 different ways that you can solve the equation:

$$6x^3 - \frac{2}{x^4} - e^{x^2} = \frac{1}{x - x^2}$$

- ▶ EXPLAIN how you would solve

$$6x^3 - \frac{2}{x^4} - e^{x^2} \leq \frac{1}{x - x^2}$$

▶ 3

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Fast Five

- ▶ If the reciprocal of $\frac{1}{x} - 1$ is -2, determine the value of x
- ▶ What is the value of $p+q$ if $\frac{p}{q} = -1$
- ▶ Solve $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ for c

▶ 4

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(A) Solving One Variable Linear Equations

- ▶ Linear equations can be solved in 3 ways:
 - ▶ (i) algebraic methods
 - ▶ (ii) graphic methods
 - ▶ (iii) numeric methods
- ▶ We will review some key ideas/steps in solving various

▶ 5

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(A) Solving Linear Equations - Algebraically

- ▶ Solve and verify:

$$-3(4x+3)+4(6x+1)=43$$

$$\frac{5}{r+3} = \frac{8}{r+4}$$

▶ 6

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(A) Solving Linear Equations - Graphically

- ▶ Now let's use the graphing calculator and the graphing option to solve the same equations → what do we look for and why?

$$-3(4x+3)+4(6x+1)=43$$

$$\frac{5}{r+3} = \frac{8}{r+4}$$

▶ 7

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(A) Solving Linear Equations - Numerically

- ▶ Now let's use the graphing calculator to solve the same equations → BUT your graphing view screen DOES not work → how would you use a table of values and why?

$$-3(4x+3)+4(6x+1)=43$$

$$\frac{5}{r+3} = \frac{8}{r+4}$$

▶ 8

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(A) Solving Linear Equations

- ▶ Under what conditions for the parameter a will the following equation have NO solution?

$$3(ax-5)=6x-2$$

- ▶ What is the graphic significance of this non-solution?

- ▶ Would your answer for the value of a change if the equation now is

$$3a(x-5)=6x-2$$

▶ 9

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(A) Solving Linear Equations

- ▶ Under what conditions for the parameter **a** and **b** will the solution set be infinite? What is the graphical significance of an infinite solution set?

$$3(ax - 5) = 6x - b$$

▶ 10

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(B) Solving Inequalities - Algebraically

- ▶ Solve the following one variable linear inequalities algebraically. Express your solution set in set notation, in interval notation, and using a number line. EXPLAIN who to verify your solution

$$-5(1 - 5x) + 5(-8x - 2) \leq -4x - 8x$$

$$\frac{x-3}{x} < \frac{9}{10} \quad \text{but their is one MAJORconsideration here.... WHY??}$$

▶ 11

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(B) Solving Inequalities - Graphically

- ▶ Solve the following one variable linear inequalities graphically. Express your solution set in set notation, in interval notation, and using a number line. EXPLAIN who to verify your solution

$$-5(1 - 5x) + 5(-8x - 2) \leq -4x - 8x$$

$$\frac{x-3}{x} < \frac{9}{10} \quad \text{but their is one MAJORconsideration here.... WHY??}$$

▶ 12

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Homework

- ▶ p. 49 # 31-55 odds, 63
- ▶ p. 58 # 47-51 odds, 56-60 evens
