Meet two

Event A: Linear Equation in One Variable

1. Solving numeric equations (perhaps involving a quadratic term which drops out)

a) Find x, if $\frac{2}{3}(x-1) = \frac{1}{12}$

b) Find x, if $\frac{2+3x}{3-x} = \frac{2x-36}{x^2-9} + \frac{2-3x}{x+3}$

2. Solving literal equations.

a) Solve for x: $\frac{a}{b}x = \frac{c}{b}$

b) Solve for x: $\frac{a}{b}\left(bx - \frac{1}{a}\right) = \frac{b}{a}\left(ax - \frac{1}{b}\right)$

3. Story problems leading to linear equations in one variable.

a) If $\frac{1}{4}$ of the world's population is Chinese and $\frac{1}{5}$ of the remainder is Indian, what percent of the world's population is Indian?

b) Lenny and Rebecca live in Leftdown and Rightcity, separated by 96 miles along Straightline Road. Lenny can ride his bike at an average of 10 miles per hour, Rebecca at 8 mph. If they leave their towns at 8 am and ride toward each other, at what time will they meet?

4. Linear inequalities.

a) Solve for x:

$3 - 2x < 18$

b) Given that $|t-1| = 1-t$ and $\sqrt{t^2} = t$, which of the following must be true?

a) $t < t^2$ b) $t \leq t^2$ c) $t > t^2$ d) $t \geq t^2$

The following is the entire event A from 1988.

Figure 1 shows the electrical circuit with three resistances, R_1, R_2, and R_3. The total resistance R_{TOTAL} is given by

$$R_T = R_1 + \frac{1}{\frac{1}{R_2} + \frac{1}{R_3}}$$

1. What is R_{TOTAL} if $R_1 = 11$, $R_2 = 21$, and $R_3 = 7$?

2. What is R_{TOTAL} if $R_1 = \frac{4}{3}$, $R_2 = \frac{3}{2}$, and $R_3 = \frac{6}{5}$?

3. Suppose you wish to obtain $R_{TOTAL} = 10$, and that $R_1 = 8, R_2 = 6$. What should you use for R_3?

4. Solve the given formula for R_3 in terms of R_T, R_1, and R_2.

3. 3 4. $R_3 = \frac{R_2(R_1 - R_T)}{R_T - R_1 - R_2}$

Answer Key

a) $\frac{9}{8}$ b) $3/2$ 2. a) $\frac{c}{a}$ b) $\frac{1}{ah}$ 3. a) 15% b) 1:20 PM 4. a) $x > -\frac{15}{2}$ b) $t \geq t^2$ and 5. 1. $16\frac{1}{4}$ 2. 2