Review #4

Monday, June 6, 2022 11:18 AM

Math 9 Review – Part 4
Solving Equations with Rational Coefficients

When an algebraic equation contains fractions (~~rational expressions~~), we will remove the denominator(s) by multiplying each term by the **lowest common denominator**.

The lowest common denominator (LCD) is the lowest common multiple that a set of fractions share.

Example 1: Solve the following equations. (Eliminate any denominators first.)

a) $14 = \frac{c}{3}$ LCD = 3

$3 \times 14 = \frac{c}{3} \times 3$

$42 = c$

b) $2 - \frac{x}{5} = 3$ LCD = 5

$5(2) - \frac{x}{5}(5) = 3(5)$

$10 - x = 15$

$-10 \quad -10$

$-x = 5$

$\frac{-x}{-1} = \frac{5}{-1}$

$x = -5$

c) $\frac{1}{3}a + 5 = \frac{1}{6}a - 6$ LCD = 6

$6\left(\frac{1}{3}a\right) + 5(6) = 6\left(\frac{1}{6}a\right) - 6(6)$

$2a + 30 = a - 36$

$-30 \quad -30$

$2a = a - 66$

$-a \quad -a$

$a = -66$

d) $\frac{x}{5} + \frac{1}{2} = \frac{3}{10}$ LCD = 10

$10\left(\frac{x}{5}\right) + \left(\frac{1}{2}\right)10 = \left(\frac{3}{10}\right)10$

$2x + 5 = 3$

$-5 \quad -5$

$\frac{2x}{2} = \frac{-2}{2}$

$x = -1$

e) $\frac{x+1}{3}-\frac{x-2}{7}=1$

LCD = 21

$21\left(\frac{x+1}{3}\right)-21\left(\frac{x-2}{7}\right)=1(21)$

$7(x+1)-3(x-2)=21$

$7(x)+7(1)+(-3)(x)-(2)(-3)=21$

$7x+7-3x+6=21$

$4x+13=21$

$-13 \quad -13$

$\frac{4x}{4}=\frac{8}{4}$

$x=2$

f) $\frac{1}{2}(p+1)+\frac{1}{3}(2p+1)=9$

LCD = 6

$6\left[\frac{1}{2}(p+1)\right]+6\left[\frac{1}{3}(2p+1)\right]=9(6)$

$3(p+1)+2(2p+1)=54$

$3p+3+4p+2=54$

$7p+5=54$

$-5 \quad -5$

$\frac{7p}{7}=\frac{49}{7}$

$p=7$

g) $\frac{48}{a}=6$

LCD = a

$a\left(\frac{48}{a}\right)=6(a)$

$\frac{48}{6}=\frac{6a}{6}$

$8=a$

h) $2=\frac{12}{x+4}$

LCD = x+4

$(x+4)(2)=\left(\frac{12}{x+4}\right)(x+4)$

$2(x+4)=12$

$2x+8=12$

$-8 \quad -8$

$\frac{2x}{2}=\frac{4}{2}$

$x=2$