MTH1W

Math 9 – Unit 3: Solving Equations

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Lesson #4: Solving with Fractions

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Learning Goal: We are learning to solve equations that contain fractions.

The final step to solving equations is to add fractions into the mix. Do not be afraid! Just follow the process and you will be fine.

① Need common denom. factors.
② Solve only the numerator.

If you have fraction = fraction, you can cross multiply

a) $\frac{x}{4} = \frac{1}{2}$ (×2 on both)

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

$x = 2$

b) $\frac{m}{6} = \frac{-1}{3}$

$3m = -6$

$\frac{3m}{3} = \frac{-6}{3}$

$m = -2$

c) $\frac{y}{2} = \frac{y}{3} - \frac{1}{1}$ (×3, ×2, ×6) CD = 6

$3y = 2y - 6$

$-2y \quad -2y$

$y = -6$

d) $\frac{5n}{2} = \frac{4n}{3} - \frac{7}{6}$ (×3, ×2) CD = 6

$15n = 8n - 7$

$-8n \quad -8n$

$7n = -7$

$\frac{7n}{7} = \frac{-7}{7}$

$n = -1$

e) $\frac{n}{3} + \frac{2}{1} = \frac{n}{5} + \frac{4}{1}$ (×5, ×15, ×3, ×15) CD = 15

$5n + 30 = 3n + 60$

$-3n \quad -30 \quad -3n \quad -30$

$2n = 30$

$\frac{2n}{2} = \frac{30}{2}$

$n = 15$

f) $\frac{(3-y)}{5} = \frac{(-2-3y)}{4}$ (×4, ×5) CD = 20

$4(3-y) = 5(-2-3y)$

$12 - 4y = -10 - 15y$

$-12 \quad +15y \quad -12 \quad +15y$

$\frac{11y}{11} = \frac{-22}{11}$

$y = -2$

★ If the numerator is a binomial, put brackets around it

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g) $\frac{n+5}{2} - \frac{n}{3} = 1$ CD = 6

$3(n+5) - 2n = 6$

$3n + 15 - 2n = 6$

$n + 15 = 6$

$-15 \quad -15$

$n = -9$

Check:

$\frac{-9+5}{2} - \frac{-9}{3}$

$\frac{-4}{2} - \frac{-9}{3}$

$-2 + 3$

1

h) $\frac{1-x}{4} - \frac{x}{2} = 7$ CD = 4

$1 - x - 2x = 28$

$1 - 3x = 28$

$-1 \quad -1$

$-3x = 27$

$\frac{-3x}{-3} = \frac{27}{-3}$

$x = -9$

i) $\frac{x+1}{3} - \frac{3x-2}{2} = -1$ CD = 6

$2(x+1) - 3(3x-2) = -6$

$2x + 2 - 9x + 6 = -6$

$-7x + 8 = -6$

$-8 \quad -8$

$-7x = -14$

$\frac{-7x}{-7} = \frac{-14}{-7}$

$x = 2$

Success Criteria:

- I can create equivalent fractions using a common denominator
- I can recognize that once every fraction has a common denominator, the denominator does not matter anymore
- I can then solve the equation using methods from prior lessons