

Math 9 – Unit 3: Solving Equations

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Lesson #4: Solving with Fractions

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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.

→ The step: turn all denominators into common denominators.

a) $\frac{x}{4} = \frac{1 \times 2}{2 \times 2}$

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

$$x = 2$$

b) $\frac{m}{6} = \frac{-1 \times 2}{3 \times 2}$

$$\frac{m}{6} = \frac{-2}{6}$$

$$m = -2$$

c) $\frac{y \times 3}{2 \times 3} = \frac{y \times 2}{3 \times 2} - \frac{1 \times 6}{1 \times 6}$

$$\frac{3y}{6} = \frac{2y}{6} - \frac{6}{6}$$

$$3y = 2y - 6$$

$$y = -6$$

d) $\frac{5n \times 3}{2} = \frac{4n \times 2}{3} - \frac{7}{6}$ C.D. = 6

$$\frac{15n}{6} = \frac{8n}{6} - \frac{7}{6}$$

$$15n = 8n - 7$$

$$7n = -7$$

$$n = -1$$

e) $\frac{n \times 5}{3} + 2 = \frac{n \times 3}{5} + 4$ C.D. = 15

$$\frac{5n}{15} + \frac{30}{15} = \frac{3n}{15} + \frac{60}{15}$$

$$5n + 30 = 3n + 60$$

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

$$n = 15$$

f) $\frac{4(3-y)}{5} = \frac{5(-2-3y)}{4}$ C.D. = 20

$$\frac{4(3-y)}{20} = \frac{5(-2-3y)}{20}$$

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

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

$$y = -2$$

$$g) \frac{3(n+5)}{2} - \frac{n^2}{3} = 1 \quad \text{C.D.} = 6$$

$$\frac{3(n+5)}{6} - \frac{2n}{6} = \frac{6}{6}$$

$$3n + 15 - 2n = 6$$

$$n = -9$$

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

$$\text{C.D.} = 4$$

$$\frac{1-x}{4} - \frac{2x}{4} = \frac{28}{4}$$

$$1 - x - 2x = 28$$

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

$$x = -9$$

$$i) \frac{2(x+1)}{3} + \frac{3(2-3x)}{2} = -1 \quad \text{C.D.} = 6$$

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

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

$$-7x + 8 = -6$$

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

$$x = 2$$