

Math 9 – Unit 3: Solving Equations

Lesson 3.2: Solving with Brackets and Fractions

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

The next layer to solving equations is to have brackets in the equations. With brackets, you first need to expand (using the Distributive Property), simplify, then use the skills from the last ~~two~~ lessons to solve. Here we go!!

a) $2(3p+4)=14$

$$6p + 8 = 14$$

$$6p = 6$$

$$p = 1$$

b) $3(m+1)+10=8-2m$

$$3m+3+10=8-2m$$

$$3m+13=8-2m$$

$$5m = -5$$

$$m = -1$$

c) $4(d+7)=-44+2(d+6)$

$$4d+28=-44+2d+12$$

$$4d+28=-32+2d$$

$$2d = -60 \quad d = -30$$

d) $3(2x+1)-(x-2)=2(x+4)$

$$6x+3-x+2=2x+8$$

$$5x+5=2x+8$$

$$3x = 3$$

$$x = 1$$

Now fractions?!?!?

e) $\frac{x}{4} = \frac{1x}{2}$ *- make common denominators*
CD=4

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

$$x = 2$$

- ignore the denominator
solve the numerator

f) $\frac{5n}{2} = \frac{4n}{3} - \frac{7}{6}$ *CD=6*

$$\frac{15n}{6} = \frac{8n}{3} - \frac{7}{6}$$

$$15n = 8n - 7$$

$$7n = -7$$

$$n = -1$$

g) $\frac{n^5}{3^5} + \frac{2}{1} = \frac{n^5}{5^5} + \frac{4}{1^5}$ $CD = 15$

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

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

$$n = 15$$

h) $\frac{4(3-y)}{5 \times 4} = \frac{5(-2-3y)}{4 \times 5}$ If you have binomials in the top, put brackets around them

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

$$\frac{12 - 4y}{-12 + 15y} = \frac{-10 - 15y}{-12 + 15y}$$

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

$$y = -2$$

i) $\frac{3(n+5)}{2 \times 3} - \frac{n^2}{3 \times 2} = \frac{1}{1^6}$ $CD = 6$

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

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

$$n + 15 = 6$$

$$n = -9$$

j) $\frac{2(x+1)}{3 \times 2} - \frac{3(3x-2)}{2 \times 3} = \frac{1}{1^6}$ $CD = 6$

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

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

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

$$-7x = -14$$

$$x = 2$$

Success Criteria:

- I can use the distributive property to eliminate brackets, then solve the equation normally
- 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
- I can then solve the equation using methods from prior lessons