

Tue 10/23/18

Section 1.2 Solving Linear Equations

(1st degree) - one is the highest exponent

ex1

$$\begin{array}{r} 5x+3 = 6-2x \\ +2x \qquad +2x \\ \hline 7x+3 = 6+0 \\ -3 \qquad -3 \\ \hline 7x+0 = 3 \\ 7x = 3 \\ \boxed{x = 3/7} \end{array}$$

This is a conditional equation.

a conditional equation is with one or no solution.

ex1 * a different approach

$$5x+3 = 6-2x$$

* move across the equal sign and change the sign.

$$5x+3 = 6-2x$$

$$5x+2x = 6-3$$

$$\begin{array}{r} 7x = 3 \\ \boxed{x = 3/7} \end{array}$$

ex2

$$5y+1 = 8y-5+6y$$

$$1+5 = 8y+6y-5y$$

$$6 = 14y-5y$$

$$6 = 9y$$

$$\frac{6}{9} = y$$

Conditional equation

$$\boxed{\frac{2}{3} = y}$$

ex3

$$2x+6 = 2(x+4)$$

$$2x+6 = 2x+8$$

$$2x-2x = 8-6$$

$$0 \neq 2$$

No solution

1) variable disappeared

2) False statement

Conditional equation

ex4

$$9x-10 = 5x+2(2x-5)$$

$$9x-10 = 5x+4x-10$$

$$9x-10 = 9x-10$$

$$9x-9x = -10+10$$

$$0 = 0$$

1) variable disappeared

2) True statement

• • Solution set of all real numbers

Identity

Equations w/ fractions

① A fraction = A fraction

$$\frac{10x+3}{5x+6} = \frac{1}{2}$$

* cross multiply

$$2(10x+3) = 1(5x+6)$$

$$20x+6 = 5x+6$$

$$20x-5x = 6-6$$

$$15x = 0$$

$$x = 0$$

Conditional equation

$$\frac{5x-4}{5x+4} = \frac{2}{3}$$

$$3(5x-4) = 2(5x+4)$$

$$15x-12 = 10x+8$$

$$15x-10x = 8+12$$

$$5x = 20$$

$$x = 4$$

Conditional equation

$$\frac{100-4x}{3} = \frac{5x+6}{4} + \frac{6}{1}$$

* handy dandy method

$$\frac{100-4x}{3} = \frac{1(5x+6) + 4(6)}{4}$$

$$\frac{100-4x}{3} = \frac{5x+6+24}{4}$$

$$\frac{100-4x}{3} = \frac{5x+30}{4}$$

$$4(100-4x) = 3(5x+30)$$

$$400-16x = 15x+90$$

$$400-90 = 15x+16x$$

$$310 = 31x$$

$$x = \frac{310}{31} = 10$$

conditional equation