

Mathematics 9

Section 6.2 - Solving Equations Using Balance Strategies

We have looked at how to solve standard one- and two-step algebra equations. Unfortunately, not all algebra equations are this neat and tidy. They will frequently involve rational numbers (fractions). The overall strategies are the same, just with a couple of added twists.

Example:

$$\frac{96}{n} = 4$$

* VARIABLES MUST END UP IN THE NUMERATOR

* LETTERS CAN BE MOVED AROUND IN THE SAME FASHION AS #S

1ST: MULTIPLY BOTH SIDES BY n

$$\cancel{n} \times \frac{96}{\cancel{n}} = 4 \times n$$

$$\frac{96}{4} = \frac{4n}{4}$$

$$24 = n$$

Example 2:

$$\cancel{3} \times \frac{2n}{\cancel{3}} = 16 \times 3$$

$$\frac{2n}{2} = \frac{48}{2}$$

$$n = 24$$

Example 3: $\frac{2n}{3} = \frac{4n}{5} + 7$

FIRST, REMOVE FRACTIONS

→ FIND A COMMON DENOMINATOR FOR ALL TERMS

* RECALL THAT A WHOLE NUMBER CAN BE WRITTEN AS A FRACTION BY PLACING IT OVER ONE.

$$\left(\frac{2n}{3}\right) \times 5 = \left(\frac{4n}{5}\right) \times 3 + \left(\frac{7}{1}\right) \times 15$$

↓

$$\frac{10n}{15} = \frac{12n}{15} + \frac{105}{15}$$

SINCE ALL DENOMINATORS ARE THE SAME WE CAN DROP THEM

$$10n = 12n + 105$$

WE NEED TO ISOLATE VARIABLES ON ONE SIDE

$$10n = 12n + 105$$

$$-12n \quad -12n$$

$$\frac{-2n}{-2} = \frac{105}{-2}$$

$$n = -52.5$$

Homework: pg.