

2.5 SOLVING MULTI-STEP EQUATIONS

Steps

- 1 DISTRIBUTE if needed
- 2 COMBINE LIKE TERMS (combine x's w/other x's)
- 3 "move variables to one side"
- 4 "get rid of" addition or subtraction
- 5 "get rid of" multiplication or division

SOLUTION

$$15(20 + d) = 420$$

Distribute ①

$$15(20 + d) = 420$$

$$300 + 15d = 420$$

② no like terms

③ no need

(+) or (-) ④

$$\begin{array}{r} 300 + 15d = 420 \\ - 300 \qquad \qquad = -300 \\ \hline 15d = 120 \end{array}$$

(+) (x) ⑤

$$\begin{array}{r} 15d = 120 \\ \hline 15 \quad 15 \\ \hline d = 8 \end{array}$$

$$-3(9 + x) = 33$$

$$\textcircled{1} \quad -27 - 3x = 33$$

~~23~~ no

$$\textcircled{4} \quad \begin{array}{r} -27 + 3x = 33 \\ +27 \quad \quad = +27 \end{array}$$

$$\textcircled{5} \quad \begin{array}{r} -3x = 60 \\ -3 \quad = -3 \end{array}$$

$$x = -20$$

$$\begin{array}{r} 5(a - 7) = 25 \\ 5a - 35 = 25 \\ +35 = +35 \\ \hline 5a = 60 \\ \frac{5a}{5} = \frac{60}{5} \end{array}$$

$$\begin{array}{l} 5 \cdot a = 5a \\ 5 \cdot -7 = -35 \end{array}$$

$$a = 12$$

$$\begin{array}{l} 6(x - 3) + 10 = 2(3x - 4) \\ 6x - 18 + 10 = 6x - 8 \end{array}$$

$$\begin{array}{r} 6x - 8 = 6x - 8 \\ +8 \quad = \quad +8 \end{array}$$

$$\frac{6x}{6} = \frac{6x}{6}$$

$$x = x$$

This is called
IDENTITY

P. 155
in wkbk
example

NUMBER OF SOLUTIONS

<u>Null Set</u>	<u>one solution</u>	<u>Identity</u>
-no solution	one solution	infinitely many solutions
$a = b$	$x = a$	$a = a$
$3x + 4 = 3x$ $4 \neq 0$ 4 doesn't = 0	$2x = 20$ $x = 10$	$4x + 2 = 4x + 2$ the solution is all numbers

$8 \cdot 4 = 32$
 $-2x = -16x$

$$8(4 - 2x) = 4(3 - 5x) + 4x$$

$$32 - 16x = 12 - 20x + 4x$$

$$32 - 16x = 12 - 16x$$

$$+16x = +16x$$

$$32 \neq 12 \quad \text{NULL SET}$$

$$-8(w - 6) = 32$$

$$-8w + 48 = 32$$

$$-48 = -48$$

$$\frac{-8w}{-8} = \frac{-16}{-8}$$

$$w = 2$$