Notes

4/29

Solving Literal Equations - solve for X

1. What are we solving for?
2. What is on the same side?
3. What is furthest?
4. How is it attached?
5. How do you undo it?

$26 = w + x$
$-w \quad -w$

$26 - w = x$

$x - w = 19$
$+w \quad +w$

$x = 19 + w$

$\frac{w}{w}x = \frac{-44}{w}$

$x = \frac{-44}{w}$

$w \cdot \frac{x}{w} = 18 \cdot w$

$x = 18w$

$wx + 7 = 31$
$-7 \quad -7$

$\frac{wx}{w} = \frac{24}{w}$

$x = \frac{24}{w}$

$68 = 12x + w$
$-w \quad -w$

$\frac{68 - w}{12} = \frac{12x}{12}$

$\frac{68 - w}{12} = x$

$-wx + 1 = -80$
$-1 \quad -1$

$\frac{-w}{-w}x = \frac{-81}{-w}$

$x = \frac{81}{w}$

$\frac{x}{w} - y = -2$
$+y \quad +y$

$w \cdot \frac{x}{w} = -2 + y \cdot w$

$x = w(-2 + y)$

$x = -2w + yw$

$z = \frac{x}{w} + y$
$-y \quad -y$

$w \cdot z - y = \frac{x}{w} \cdot w$

$w(z - y) = x$

$wz - wy = x$

$2(x + w) = -2$

$2x + 2w = -2$
$-2w \quad -2w$

$\frac{2x}{2} = \frac{-2 - 2w}{2}$

$x = -1 - 1w$

solve for d

$t \cdot r = \frac{d}{t} \cdot t$

$tr = d$

solve for m

$\frac{F}{a} = \frac{m \cdot a}{a}$

$\frac{F}{a} = m$

solve for h

$2 \cdot A = \frac{1}{2}bh \cdot 2$

$\frac{2A}{b} = \frac{bh}{b}$

$\frac{2A}{b} = h$

$P = 2L + 2w$

$-2L \quad -2L$

$P - 2L = 2w$

$\frac{P-2L}{2} = \frac{2w}{2}$

$\frac{P-2L}{2} = w$

Everything must divide by 2 "nicely" P does not

or $\frac{1}{2}P - L = w$

Practice

① $\frac{P}{IR} = \frac{IRI}{IR}$ (I)

$\frac{P}{IR} = I$

② $A = 2(L+W)$ (W)

$A = 2L + 2W$

$-2L \quad -2L$

$A - 2L = 2W$

$\frac{A-2L}{2} = \frac{2W}{2}$

$\frac{A-2L}{2} = W$

③ $y = 5x - 6$ (x)

$+6 \quad +6$

$y + 6 = 5x$

$\frac{y+6}{5} = \frac{5x}{5}$

$\frac{y+6}{5} = x$

④ $2x - 3y = 8$ (y)

$-2x \quad -2x$

$\frac{-3y}{-3} = \frac{8-2x}{-3}$

$y = \frac{8-2x}{-3}$

⑤ $\frac{x+y}{3} = 5.3$ (x)

$x + y = 15$

$-y \quad -y$

$x = 15 - y$

⑥ $y = mx + b$ (b)

$-mx \quad -mx$

$y - mx = b$ or $b = y - mx$

⑦ $ax + by = c$ (y)

$-ax \quad -ax$

$\frac{by}{b} = \frac{c-ax}{b}$

$y = \frac{c-ax}{b}$

⑧ $A = h(b+c)$ (b)

$A = hb + hc$

$-hc \quad -hc$

$\frac{A-hc}{h} = \frac{hb}{h}$

$\frac{A}{h} - c = b$

⑨ $\frac{V}{WH} = \frac{LWH}{WH}$ (L)

$\frac{V}{WH} = L$ or $L = \frac{V}{WH}$

(10) $A = 4\pi r^2$ (÷a)

$\frac{A}{4} = \frac{4\pi r^2}{4}$

$\frac{A}{4} = r^2$

(11) $V = \pi r^2 h$ (÷h)

$\frac{V}{\pi r^2} = \frac{\pi r^2 h}{\pi r^2}$

$\frac{V}{\pi r^2} = h$

(12) $7x - y = 14$ (+y)

$+y \quad +y$

$\frac{7x}{7} = \frac{14+y}{7}$

$x = \frac{14+y}{7}$

(13) $A = \frac{x+y}{2}$ (·2)

$2A = x + y$

$-x \quad -x$

$2A - x = y$

(14) $R = \frac{E}{I}$ (·I)

$\frac{IR}{R} = \frac{E}{R}$

$I = \frac{E}{R}$

(15) $X = \frac{yz}{6}$ (·6)

$\frac{6X}{y} = \frac{yz}{y}$

$Z = \frac{6X}{y}$

(16) $A = \frac{L}{2L}$ (·2L)

$\frac{2LA}{2L} = \frac{L}{2A}$

$L = \frac{L}{2A}$

(17) $A = \frac{a+b+c}{3}$ (·3)

$3A = a + b + c$

$-c \quad -c$

$3A - c = a + b$

$-a \quad -a$

$3A - a - c = b$

(18) $12x - 4y = 20$

$-12x \quad -12x$

$\frac{-4y}{-4} = \frac{20-12x}{-4}$

$y = -5 + 3x$

or $y = 3x - 5$

-4 goes into 20 and -12

(19) $4x = 2y - z$ (÷4)

$\frac{4x}{4} = \frac{2y-z}{4}$

$4x = 2y - z$

$-2y \quad -2y$

$4x - 2y = -z$

$\frac{4x-2y}{-1} = \frac{-z}{-1}$

$-4x + 2y = z$

or

$z = 2y - 4x$

(20) $N \cdot P = R - C$ (R)

$NP = R - C$

$+C \quad +C$

$NP + C = R$

$R = NP + C$