# 3.1 One-Step Equations

## Inverse Operations

* Cancel each other out / undo each other

Open door & close door

untie shoe & tie shoe

adding 12 & Subtract 12

Subtract 2 & add 2

Multiply by 3 & divide 3

+ & − → undo each other

÷ & *

# Solve

1) $x + 3 = 5$

$-3 \quad -3$

$x = 2$

Undo +3 by −3 (inverses!)

2) $x - 12 = 3$

3) $6x = 42$

4) $4.5 = \frac{x}{4} \cdot 4$ ← are ÷ x by 4, so * by 4 to undo!

$20 = x$

5) $\frac{2}{3}x = 6$ ← Multiply by the reciprocal of $\frac{2}{3}$ $\left(\frac{2}{3} \rightsquigarrow \frac{3}{2}\right)$

$\frac{3}{2} \cdot \frac{2}{3}x = 6 \cdot \frac{3}{2}$

$\frac{6}{6} = 1$ $\quad \frac{6}{1} \cdot \frac{3}{2} = \frac{18}{2} = 9$

$1x = 9$ or $x = 9$

6) $-x = 17$

$-1x = 17$

$\frac{-1}{-1}x = \frac{17}{-1}$ $\quad \frac{+}{-} = -$

$x = -17$

$\frac{+}{+} = +$ $\quad \frac{-}{+} = -$

$\frac{-}{-} = +$ $\quad \frac{+}{-} = -$

# Homework

Solve

(3) $x+5=8$

(5) $11=f+6$

(9) $y-4=3$

(11) $14=k-3$

(13) $-2=n-6$

(17) $5g=20$

(19) $48=6c$

(21) $15=-h$

(23) $\frac{y}{3}=5$

(43) $\frac{3}{2}k=18$

(Skip 1 for 3-13)