

PROBLEM-SOLVING STRATEGY

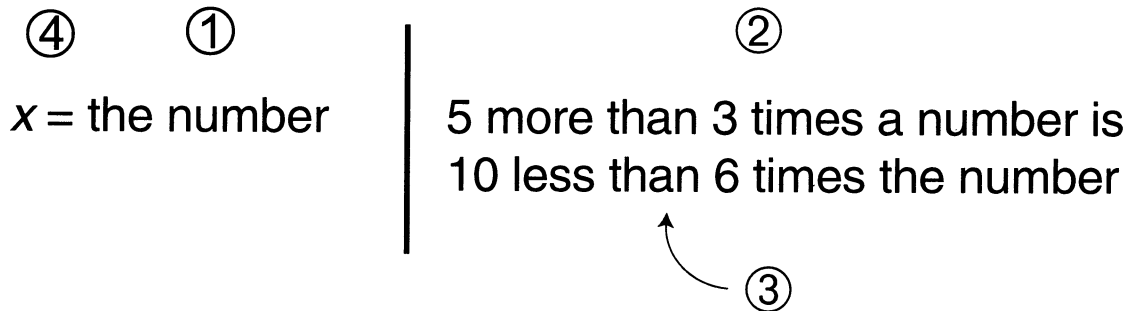
1. How many **things** are there? (write them down)
2. What are the **is-sentences**? (write them down)
3. Which **is-sentence** will be used for the **open sentence**? (save it)
4. How will we **represent** the things? (use the remaining **is-sentences**, letting something be "x")
5. What is the open-sentence? (translate and solve)

**“One number is three times another number.
The sum of the numbers is 24.
What are the numbers?”**

④		①			②
3x		one number (larger)			larger is 3 times smaller
x		another number (smaller)			sum is 24
		⑤			③
			$3x + x$	=	24
	C.L.T.		$4x$	=	24
	Mult. $\frac{1}{4}$		$\frac{1}{4}(4x)$	=	$\frac{1}{4}(24)$
			$1x$	=	$\frac{24}{4}$ or 6 ✓
	So,		$3x$	=	18 ✓

“NUMBER” PROBLEMS

“Five more than three times a number is ten less than six times the number.”



⑤

	$5 + 3x$	=	$6x - 10$
Add $-3x$	$5 + 3x + ^{-}3x$	=	$6x - 10 + ^{-}3x$
	5	=	$3x - 10$
Add 10	$5 + 10$	=	$3x - 10 + 10$
	15	=	$3x$
Mult. $\frac{1}{3}$	$\frac{1}{3}(15)$	=	$\frac{1}{3}(3x)$
	$\frac{15}{3}$ or 5	=	x ✓

The number is 5.

“NUMBER” PROBLEMS

“When you add two numbers, you get 34.
The larger number is six more than three times
the smaller number. What are the numbers?”

④		①	②
$6 + 3n$ n	–	larger number smaller number	sum is 34 larger is 6 more than 3 times smaller
			③

⑤

	$6 + 3n + n$	$= 34$
C.L.T.	$6 + 4n$	$= 34$
Add -6	$6 + 4n + ^{-}6$	$= 34 + ^{-}6$
	$4n$	$= 28$
Mult. $\frac{1}{4}$	$\frac{1}{4}(4n)$	$= \frac{1}{4}(28)$
	$1n$	$= \frac{28}{4}$ or 7
So,	$6 + 3n$	$= 27 \checkmark$

“NUMBER” PROBLEMS

“When you add two numbers, you get 34.
The larger number is six more than three times
the smaller number. What are the numbers?”

④

$$\begin{array}{l} n \\ 34 - n \end{array}$$

①
larger number
smaller number

②
sum is 34
larger is 6 more than
3 times smaller

③

⑤

$$\begin{array}{l} n \\ \text{Dist.} \\ \text{C.L.T.} \\ \text{Add } 3n \\ \text{Mult. } \frac{1}{4} \\ \text{So,} \end{array} \quad \begin{array}{l} n \\ n \\ n + 3n \\ 4n \\ \frac{1}{4}(4n) \\ 1n \\ 34 - n \end{array} \quad \begin{array}{l} = 6 + 3(34 - n) \\ = 6 + 102 - 3n \\ = 108 - 3n \\ = 108 - 3n + 3n \\ = 108 \\ = \frac{1}{4}(108) \\ = \frac{108}{4} \text{ or } 27 \checkmark \\ = 7 \checkmark \end{array}$$

“CONSECUTIVE INTEGER” PROBLEMS

“Find three consecutive odd integers,
such that 4 times the first is 7 less than
5 times the third.”

<p>④</p> <p>x</p> <p>$x + 2$</p> <p>$x + 4$</p>	<p>①</p> <p>– 1st odd integer</p> <p>– 2nd odd integer</p> <p>– 3rd odd integer</p>	<p style="text-align: center;">②</p> <p>4 times 1st is 7 less than 5 times 3rd ←</p> <p>2nd is 2 more than 1st</p> <p>3rd is 2 more than 2nd</p> <p style="text-align: right;">③</p>
--	---	--

	<p>⑤</p> <p>$4x$</p>	<p>$= 5(x + 4) - 7$</p>
Dist.	$4x$	$= 5x + 20 - 7$
C.L.T.	$4x$	$= 5x + 13$
Add $-4x$	$4x + -4x$	$= 5x + 13 + -4x$
	0	$= 1x + 13$
Add -13	$0 + -13$	$= x + 13 + -13$
	-13	$= x \quad \checkmark$
So,	-11	$= x + 2 \quad \checkmark$
So,	-9	$= x + 4 \quad \checkmark$

“AGE” PROBLEMS

“Tanicka is 8 years older than Sam. 5 times Sam’s age 4 years ago is the same as 2 times Tanicka’s age 6 years from now.
Find the ages of Sam and Tanicka.”

<p>④</p> <p>n Sam’s age</p> <p>$n + 8$ <u>Tanicka’s age</u></p> <p>$n - 4$ Sam (4 yrs. ago)</p> <p>$n + 4$ <u>Tanicka (4 yrs. ago)</u></p> <p>$n + 6$ Sam (6 years from now)</p> <p>$n + 14$ Tanicka (6 years from now)</p>	<p>①</p> <p>Tanicka’s age is 8 more than Sam’s age</p> <p>5 times Sam (4 yrs. ago) is 2 times Tanicka (6 yrs. from now)</p> <p>③</p>
---	--

	⑤	$5(n - 4)$	=	$2(n + 14)$
Dist.		$5n - 20$	=	$2n + 28$
Add $-2n$		$5n - 20 + -2n$	=	$2n + 28 + -2n$
		$3n - 20$	=	28
Add 20		$3n - 20 + 20$	=	$28 + 20$
		$3n$	=	48
Mult. $\frac{1}{3}$		$\frac{1}{3}(3n)$	=	$\frac{1}{3}(48)$
		$1n$	=	$\frac{48}{3}$ or 16 yrs. ✓
So,		$n + 8$	=	24 yrs. ✓

“MOTION” PROBLEMS

“A car leaves Sioux City traveling west at a constant speed of 60 kph. Two hours later, another car leaves Sioux City, traveling in the same direction at a constant speed of 75 kph. How long will it take for the faster car to catch the slower one?”

①

slow distance
fast distance
slow rate
fast rate
slow time
fast time

②

slow distance is fast distance
slow rate is 60
fast rate is 75
slow time is 2 more than fast time
distance is rate times time (slow)
distance is rate times time (fast)

③

④

	distance	rate	time
Slow	$60(T+2)$	60	$T+2$
Fast	$75T$	75	T

⑤

$$\begin{aligned}
 & 60(T + 2) & = & 75T \\
 \text{Dist.} & \quad \quad \quad \curvearrowright & & \\
 & 60T + 120 & = & 75T \\
 \text{Add } -60T & & & \\
 & 60T + 120 + ^-60T & = & 75T + ^-60T \\
 & \quad \quad \quad 120 & = & 15T \\
 \text{Mult. } \frac{1}{15} & & & \\
 & \frac{1}{15}(120) & = & \frac{1}{15}(15T) \\
 & \frac{120}{15} \text{ or 8 hrs.} & = & 1T \quad \checkmark \\
 \text{So,} & \quad \quad \quad 10 \text{ hrs.} & = & 1T + 2 \quad \checkmark
 \end{aligned}$$