

4-1 Finding TWO Unknown Numbers

- (1) Create a "Let Statement" Chart
- (2) Box operation keywords and translate into equation.
- (3) Solve the equation for the missing values!
- (4) Did you answer the question?

(1) One number is 5 larger than another. The sum of the numbers is 29. Find the two numbers.

Let:

1st #	$n = 12$
2nd #	$n + 5 = 17$

$1st + 2nd = 29$   
 $12 + 5 = 29$

$n + n + 5 = 29$

$2n + 5 = 29$   
 $\underline{-5} \quad \underline{-5}$

$2n = 24$   
 $\frac{2n}{2} = \frac{24}{2}$   $n = 12$

(2) The first number is four times the second number. Their sum is 150. Find the numbers.

Let:

1st #	$4n = 120$
2nd #	$n = 30$

$1st + 2nd = 150$   
 $4n + n = 150$

$4n + n = 150$

$5n = 150$   
 $\frac{5n}{5} = \frac{150}{5}$

$n = 30$

(3) The second number is seven more than the first. If twice the larger is 22 less than four times the smaller, what are the two numbers?

Let:

1st #	$n = 18$
2nd #	$7 + n = 25$

$2(\text{larger}) = 4(\text{smaller}) - 22$

$2(7+n) = 4n - 22$

$14 + 2n = 4n - 22$   
 $\underline{-2n} \quad \underline{-2n}$

$14 = 2n - 22$   
 $\underline{+22} \quad \underline{+22}$

$36 = 2n$   
 $\frac{36}{2} = \frac{2n}{2}$   $n = 18$

(4) The second number is eight less than three times the first. Their sum is 136. What is the smaller number?

Let:

1st #	$n = 36$
2nd #	$3n - 8 = 100$

$1st + 2nd = 136$

$n + 3n - 8 = 136$

$4n - 8 = 136$   
 $\underline{+8} \quad \underline{+8}$

$4n = 144$   
 $\frac{4n}{4} = \frac{144}{4}$

$n = 36$

(5) The larger of two numbers is seven times the smaller. If the sum of the two numbers exceeds their difference by 20, what are the two numbers?

small	$n$	10
large	$7n$	70

$$\begin{aligned}
 7n + n &= 7n - n + 20 \\
 8n &= 6n + 20 \\
 -6n &\quad -6n \\
 2n &= 20 \\
 \boxed{n=10}
 \end{aligned}$$

(6) One number is 20 more than another number. Twice the larger increased by 15 is 5 less than four times the smaller. Find the value of the larger number.

1st	$n$	30
2nd	$n+20$	50

The larger # is 50.

$$\begin{aligned}
 2(n+20)+15 &= 4n-5 \\
 2n+40+15 &= 4n-5 \\
 2n+55 &= 4n-5 \\
 \boxed{n=30}
 \end{aligned}$$

(7) One number is 3 less than twice another number. The sum of the numbers is 21. Find the numbers.

1st	$n$	8
2nd	$2n-3$	13

$$\begin{aligned}
 n + 2n - 3 &= 21 \\
 3n - 3 &= 21 \\
 +3 &\quad +3 \\
 3n &= 24 \\
 \boxed{n=8}
 \end{aligned}$$

(8) The sum of two numbers is 84. The larger of the two numbers is twelve more than the smaller number. What are the two numbers?

small	$n$	36
large	$n+12$	48

$$\begin{aligned}
 n + n + 12 &= 84 \\
 2n + 12 &= 84 \\
 -12 &\quad -12 \\
 2n &= 72 \\
 \boxed{n=36}
 \end{aligned}$$

(9) One number is 10 more than another. The sum of twice the smaller number, plus three times the larger number is 55. What are the two numbers?

small	$n$	5
large	$n+10$	15

$$\begin{aligned}
 2n + 3(n+10) &= 55 \\
 2n + 3n + 30 &= 55 \\
 5n + 30 &= 55 \\
 5n &= 25 \\
 \boxed{n=5}
 \end{aligned}$$

(10) Divide \$80 among three people so that the second person will have twice as much as the first, and the third will have \$5 less than the second.

1st	$n$	17
2nd	$2n$	34
3rd	$2n-5$	29

\$17, \$34 and \$29

$$\begin{aligned}
 2n - 5 + 2n + n &= 80 \\
 5n - 5 &= 80 \\
 5n &= 85 \\
 \boxed{n=17}
 \end{aligned}$$

(11) A class of 50 students is divided into two groups; one group has eight less than the other. How many students are in each group?

1st	$n$	29
2nd	$n-8$	21

$$\begin{aligned}
 n + n - 8 &= 50 \\
 2n - 8 &= 50 \\
 +8 &\quad +8 \\
 2n &= 58 \\
 \frac{2n}{2} &= \frac{58}{2} \\
 \boxed{n=29}
 \end{aligned}$$

(12) Two numbers combined is 72. One of them is five times the other. What are the two numbers?

1st	$n$	12
2nd	$5n$	60

$$\begin{aligned}
 5n + n &= 72 \\
 6n &= 72 \\
 \frac{6n}{6} &= \frac{72}{6} \\
 \boxed{n=12}
 \end{aligned}$$