Unit 4: Writing & Solving Linear Equations

4-2 Find the Missing Number

Warm Up:
Six less than four times a number is 42.
What is the number?

Let n = the number

$$4n - 6 = 42$$
$$+6 \quad +6$$
$$4n = 48 \qquad \boxed{n = 12}$$

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

Example 1: Eight more than twice a number is 28. Find the number.

Let n = number

$$2n + 8 = 28$$
$$-8 \quad -8$$
$$\frac{2n}{2} = \frac{20}{2}$$
$$\boxed{n = 10}$$

Example 2: Nine less than three times a number is 54. Find the number. Let n = #

$$3n - 9 = 54$$
$$+9 \quad +9$$
$$\frac{3n}{3} = \frac{63}{3}$$
$$\boxed{n = 21}$$

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(1) Nine more than a number is 13. Find the number. Let n = #

$$n + 9 = 13$$
$$-9 \quad -9$$
$$\boxed{n = 4}$$

(2) A number decreased by 10 is 16. What is the number? Let n = #

$$n - 10 = 16$$
$$+10 \quad +10$$
$$\boxed{n = 26}$$

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(3) Eleven increased by twice a number is 17. Find the number. Let n = #

$$11 + 2n = 17$$
$$-11 \qquad -11$$
$$\frac{2n}{2} = \frac{6}{2} \qquad \boxed{n = 3}$$

(4) Eight less than five times a number is 22. Find the number. Let n = #

$$5n - 8 = 22$$
$$+8 \quad +8$$
$$\frac{5n}{5} = \frac{30}{5} \qquad \boxed{n = 6}$$

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(5) Sixteen is five less than 7 times a number. What is the number?

$$16 = 7n - 5$$
$$+5 \qquad +5$$
$$\frac{21}{7} = \frac{7n}{7} \qquad \boxed{n = 3}$$

(6) If three more than eight times a number is -29, what is the number?

$$3 + 8n = -29$$
$$-3 \qquad -3$$
$$\frac{8n}{8} = \frac{-32}{8} \qquad \boxed{n = -4}$$

Example 3: Ten less than twice a number is the same as 7 times the number. Find the number.

Let $n =$ number

$$2n - 10 = 7n$$
$$-2n \qquad -2n$$
$$\frac{-10}{5} = \frac{5n}{5}$$
$$\boxed{-2 = n}$$

Example 4: A number increased by 30 is 14 decreased by 3 times the number. Find the number.

Let $n =$ number

$$n + 30 = 14 - 3n$$
$$+3n \qquad\qquad +3n$$
$$4n + 30 = 14$$
$$\quad -30 \;-30$$
$$\frac{4n}{4} = \frac{-16}{4} \qquad \boxed{n = -4}$$

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(7) Nine more than 5 times a number is equivalent to 2 times the number. Find the number.

$$9 + 5n = 2n$$
$$-5n \quad -5n$$
$$\frac{9}{-3} = \frac{-3n}{-3}$$
$$\boxed{-3 = n}$$

(8) Twice a number is the same as 6 more than 8 times the number.

$$2n = 6 + 8n$$
$$-8n \qquad -8n$$
$$\frac{-6n}{-6} = \frac{6}{-6}$$
$$\boxed{n = -1}$$

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(9) Seven less than 6 times a number is the same as the number decreased by 2. Find the number.

$$6n - 7 = n - 2$$
$$-n \qquad -n$$
$$5n - 7 = -2$$
$$\quad +7 \quad +7$$
$$\frac{5n}{5} = \frac{5}{5} \qquad \boxed{n = 1}$$

(10) Five times a number is equivalent to 30 more than 8 times the same number. What is the number?

$$5n = 30 + 8n$$
$$-8n \qquad -8n$$
$$\frac{-3n}{-3} = \frac{30}{-3}$$
$$\boxed{n = -10}$$

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(11) A number plus three more than that number is 17. What is the number?

$$n + 3 + n = 17$$
$$2n + 3 = 17$$
$$\quad -3 \quad -3$$
$$2n = 14$$
$$\boxed{n = 7}$$

(12) Six more than a number, increased by that number is 40. Find the number.

$$6 + n + n = 40$$
$$2n + 6 = 40$$
$$\quad -6 \quad -6$$
$$\frac{2n}{2} = \frac{34}{2} \qquad \boxed{n = 17}$$

Example 5: Five times the sum of a number and 2 is 45. Find the number.

Example 6: Six times the difference of a number and 4 is 30. Find the number.

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(13) Five more than a number is 4 times the sum of a number and 8. What is the number? *Let n = number*

$$5 + n = 4(n+8)$$
$$5 + n = 4n + 32$$
$$-n \quad\quad -n$$
$$5 = 3n + 32$$
$$-32 \quad\quad\quad -32$$
$$\frac{-27}{3} = \frac{3n}{3} \quad \boxed{n = -9}$$

(14) Three times the sum of 4 and a number is the same as 18 increased by the number. Find that number. *Let n = #*

$$3(n+4) = 18 + n$$
$$3n + 12 = 18 + n$$
$$-n \quad\quad\quad\quad -n$$
$$2n + 12 = 18$$
$$\quad\quad -12 \quad -12$$
$$\frac{2n}{2} = \frac{6}{2} \quad \boxed{n = 3}$$

(15) Twice the sum of 6 and a number is the same as 15 decreased by the number. Find the number. *Let n = #*

$$2(n+6) = 15 - n$$
$$2n + 12 = 15 - n$$
$$+n \quad\quad\quad\quad +n$$
$$3n + 12 = 15$$
$$\quad\quad -12 \quad -12$$
$$\frac{3n}{3} = \frac{3}{3} \quad \boxed{n = 1}$$

(16) Eight more than three times a number is the same as twice the number decreased by 6. Find the number. *Let n = #*

$$8 + 3n = 2n - 6$$
$$-2n \quad\quad -2n$$
$$8 + n = -6$$
$$-8 \quad\quad\quad -8$$
$$\boxed{n = -14}$$