

M8 - 10.8 - Expressions Notes

Word	Meaning
Sum, More, Add, Increased	+
Difference, Less, Subtract, Decreased, Take away	−
Product, Times, Multiplied	×
Quotient, Divide, Split	÷

Common Written Phrase	Algebraic Expression
Five more than a number	$x + 5$
Four less than a number	$x - 4$
A number less than three	$3 - x$
Twice a number	$2x$
Half a number	$\frac{x}{2}$
Six divided by a number	$\frac{6}{x}$
Two thirds of a number	$\frac{2}{3}x$

Written Phrase	Algebraic Expression
Five more than a number, five added to a number, five more than x , x plus five, a number plus five, the sum of a number and five.	$x + 5$
Four less than a number, four subtracted from a number, four less than x , x minus four, a number minus four, the difference of a number and four, a number decreased by four.	$x - 4$
A number less than three, a number subtracted from three, x less than three, three minus x , three minus a number, the difference of three and a number, three decreased by a number.	$3 - x$
Twice a number, two times a number, two times x , x times two, the sum of two and a number, the sum of two and x .	$2x$
Half a number, a number divided by two, x divided by two, half of x , the quotient of a number and two, a number split into two parts, one half x	$\frac{x}{2}$ or $\frac{1}{2}x$
Six divided by a number, the quotient of six and a number, six divided by x , six split into x parts.	$\frac{6}{x}$
Two thirds of a number, a number times two thirds, a number divided by three and multiplied by two.	$\frac{2}{3}x$ or $\frac{2x}{3}$

Three more than a number

$$x + 3$$

Eight less than a number

$$x - 8$$

A number less than four

$$4 - x$$

Five times a number

$$5x$$

A third of a number

$$\frac{x}{3}$$

Eight divided by a number

$$\frac{8}{x}$$

M8 - 10.8 - Create/Solve Equations Notes

Find and Solve the following Equations

Five more than a number is 8. What is the number?

$$\begin{array}{r} x + 5 = 8 \\ -5 \quad -5 \\ \hline x = 3 \end{array}$$

The number is 3.

Three less than twice a number is 7. What is the number?

$$\begin{array}{r} 2n - 3 = 7 \\ +3 \quad +3 \\ \hline 2n = 10 \\ \div 2 \quad \div 2 \\ \hline n = 5 \end{array}$$

The number is 5.

M8 - 10.9 - 1 Var Word Problems Notes

"Let" Statements

Choosing a letter that represents the number you need to find.

Bob is 6 years older than Mark. Mark is 30. How old is Bob?

Let m = Mark's age.

Let $m + 6$ = Bob's age

$$\begin{aligned}m + 6 &= \text{Bob's age} \\ (30) + 6 &= \text{Bob's age} \\ 36 &= \text{Bob's age}\end{aligned}$$

Substitute Mark's age $m = 30$

$$\text{Bob's age} = 36$$

Arbitrary

$$\text{Mark} = 10$$

$$\text{Bob} = m + 6$$

$$\text{Bob} = 10 + 6$$

$$\text{Bob} = 16$$

*Bob is 6 years
older than Mark*

Nick is two years younger than twice Damon's age. Nick is 28. How old is Damon?

Let d = Damon's Age

Let $2d - 2$ = Nick's age

$$\begin{aligned}2d - 2 &= \text{Nick's age} \\ 2d - 2 &= 28 \\ +2 \quad +2 \\ 2d \quad 30 \\ \hline 2 \quad 2 \\ d &= 15\end{aligned}$$

Substitute Nick's age = 28

$$\text{Damon's age } d = 15$$

M8 - 10.9 - 1 Var Now/Then Notes

Barb is 3 years older than Mark. In 4 years from now, the sum of their ages will be 21. How old are they now?

Let $x = \text{Mark's age}$

Let $x + 3 = \text{Barb's age}$

	Now	Then
Barb	$x + 3$	$(x + 3) + 4$
Mark	x	$x + 4$

$$(x + 3 + 4) + (x + 4) = 21$$

$$x + 7 + x + 4 = 21$$

$$2x + 7 + 4 = 21$$

$$2x + 11 = 21$$

$$\begin{array}{r} -11 \\ 2x + 11 = 21 \\ \hline 2x = 10 \end{array}$$

$$\begin{array}{r} 2x = 10 \\ \hline \frac{2x}{2} = \frac{10}{2} \end{array}$$

$$\frac{2x}{2} = \frac{10}{2}$$

$$x = 5$$

Mark is 5

$$x + 3 =$$

$$(5) + 3 = 8$$

Barb is 8

Stella is 10 years older than Alina. In 5 years from now, Stella will be twice Alina's age. How old is Stella and Alina?

Let $x = \text{Alina's age}$.

	Now	Then
Stella	$x + 10$	$(x + 10) + 5$
Alina	x	$x + 5$

$$(x + 10) + 5 = 2(x + 5)$$

$$x + 15 = 2x + 10$$

$$\begin{array}{r} -x \\ x + 15 = 2x + 10 \\ \hline 15 = x + 10 \end{array}$$

$$15 = x + 10$$

$$\begin{array}{r} -10 \\ 15 = x + 10 \\ \hline 5 = x \end{array}$$

$$\boxed{5 = x}$$

$$x = 5$$

Alina is 5.

$$x + 10$$

$$\boxed{(5) + 10 = 15}$$

Stella is 15.

Two consecutive numbers sum to 11. What are the two numbers?

Let $x = \text{first number}$

Let $x + 1 = \text{second number}$

$$x + (x + 1) = 11$$

$$x + x + 1 = 11$$

$$2x + 1 = 11$$

$$\begin{array}{r} -1 \\ 2x + 1 = 11 \\ \hline 2x = 10 \end{array}$$

$$\begin{array}{r} 2x = 10 \\ \hline \frac{2x}{2} = \frac{10}{2} \end{array}$$

$$\frac{2x}{2} = \frac{10}{2}$$

$$\boxed{x = 5}$$

5 is the smaller number.

$$x + 1$$

$$\boxed{(5) + 1 = 6}$$

6 is the larger number.