

3 VARIABLES, EXPRESSIONS, AND EQUATIONS (1.3)

A **variable** is a letter used to “stand in” for any number or a variety of numbers.

To **evaluate** an expression with a variable in it, substitute the numbers provided for their corresponding letters and find the value of the expression.

Evaluate:

$\frac{m-n}{5}$	when $m = 16$ and $n = 6$	$2(a + 3b)$	when $a = 3$ and $b = 2$
		$= 2(3 + 3 \cdot 2)$	Replace letters with numbers
$= \frac{16-6}{5}$	Replace m with 16 and n with 6	$= 2(3 + 6)$	
		$= 2(9)$	Simplify
$= \frac{10}{5}$	Simplify and reduce if possible	$= 18$	
$= 2$			

Some key words for **translating** words to algebraic expressions and equations:

Addition (+)	Subtraction (-)	Multiplication (•)	Division (÷)	Equal (=)
add	subtract	multiply	divide	is
sum	difference	product	quotient	was
plus	minus	times	divided by	will be
more than	less than	twice	ratio of	result is
increased by	decreased by	of		results in
greater than	take from			produces

Translate: 4 less than d (Be careful! $4 - d$ is NOT the same as $d - 4$. Ask yourself, what is being subtracted from what? 4 less than d means $d - 4$)

4 less than d

|

subtraction

$d - 4$

Translate: Seven times what number is 2233?

| | | | |

$7 \cdot n = 2233$

$7n = 2233$

Translate: The quotient of a number and 15. (Let n stand for “number”.)

| | |

Divide n by 15

$\frac{n}{15}$

(“Quotient of” or “ratio of” always means the first number or variable divided by the second.)

PROBLEMS

Evaluate.

1. $\frac{4m}{y}$ when $m = 2$ and $y = 8$

2. $\frac{x-z}{m}$ when $x = 7$, $z = 2$, and $m = 3$

Translate to an algebraic expression.

3. c more than d

6. the quotient of p and t

4. twice q

7. 9 less than n

5. one fourth of m

Translate to an equation.

8. What number added to 51 will give you 80?

9. When a number is doubled the result is 28.

Translate and evaluate.

10. Mary is 4 years older than her husband Doug. Suppose the variable “ x ” represents Doug’s age.

a) What variable expression would represent Mary’s age?

b) How old is Mary when Doug is 32?

c) How old is Mary when Doug is 40?

ANSWERS

1. 1

6. $\frac{p}{t}$

2. $\frac{5}{3}$ or $1\frac{2}{3}$

7. $n - 9$

3. $d + c$ or $c + d$

8. $51 + n = 80$ (you may use any letter for “number”)

4. $2q$

9. $2n = 28$ (you may use any letter for “number”)

5. $\frac{1}{4}m$ or $\frac{m}{4}$

10. a) $x + 4$ b) 36 c) 44