

MODELING PROBLEMS ALGEBRAICALLY

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Name: Key Date: _____ Period: _____

SECTION 3.1 VARIABLES AND EXPRESSIONS

VOCABULARY

DEFINITION	EXAMPLE
Variable: a letter or symbol that represents an unknown quantity	$a, n,$ $3 + X \leftarrow$
Expressions: mathematical phrases used to describe quantities	$15, 3x,$ $2m + y$

Big Idea: How do we translate mathematical expressions into words? How do we translate words into mathematical expressions?

EXPLORATION

Each expression below contains a key word or phrase that allows us to categorize the expression. Sort these expressions and write them in the table on the next page.

- | | |
|-----------------------------|---------------------------|
| The sum of x and 5 | 5 greater than x |
| The addition of 5 and x | 5 multiplied by x |
| The difference of x and 5 | The quotient of x and 5 |
| x is increased by 5 | 5 subtracted from x |
| 5 times x | x minus 5 |
| The product of 5 and x | 5 added to x |
| Take away 5 from x | x decreased by 5 |
| 5 more than x | 5 less than x |
| x divided by 5 | x plus 5 |

<p>Addition $x + 5$ <i>The sum of x and 5</i> <i>The addition of x and 5</i> <i>x is increased by 5</i> <i>5 more than x</i> <i>5 greater than x</i> <i>5 added to x</i> <i>x plus 5</i></p>	<p>Subtraction $x - 5$ <i>The difference of x and 5</i> <i>Take away 5 from x</i> <i>5 subtracted from x</i> <i>x minus 5</i> <i>x decreased by 5</i> <i>5 less than x</i></p>
<p>Multiplication $5x$ <i>5 times x</i> <i>The product of 5 and x</i> <i>5 multiplied by x</i></p>	<p>Division $\frac{x}{5}$ <i>x divided by 5</i> <i>The quotient of x and 5</i></p>

What other ways can you think of to write mathematical expressions?

Answers will vary

EXAMPLE 1

Translate "five more than two" into a mathematical expression.

$2 + 5$

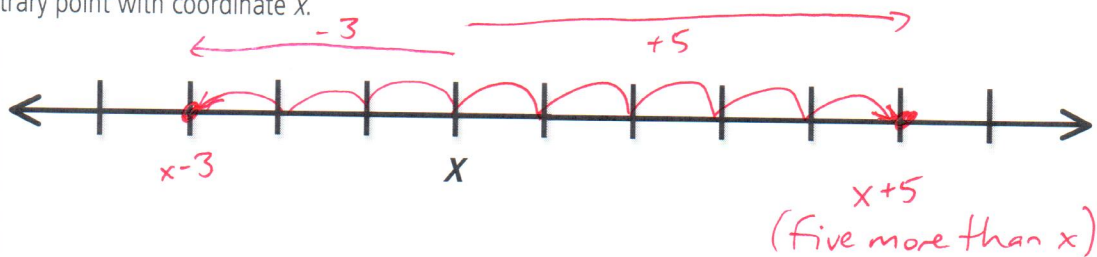
EXAMPLE 2

Translate "five less than two" into a mathematical expression.

$$2 - 5$$

EXAMPLE 3

Translate "five more than x " into a mathematical expression. Illustrate this on the number line with an arbitrary point with coordinate x .



EXAMPLE 4

Translate the expression, " $x - 3$ " into a word phrase. Locate $x - 3$ on the number line in Example 3.

3 less than x or x minus 3, etc.

EXAMPLE 5

Translate the expression " $-4 + 6$ " into a word phrase.

the sum of negative four and six, 6 more than -4, etc.

EXAMPLE 6

Using the symbol $>$, write an inequality that says "5 is greater than x ."

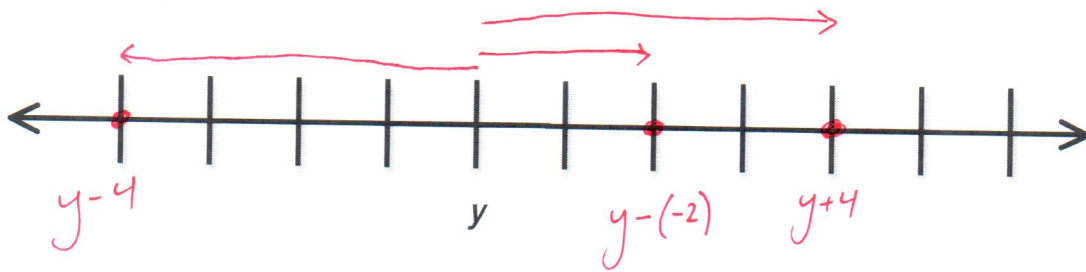
$$5 > x$$

PRACTICE EXERCISES

1. Translate $3 - 2$ into words in three different ways.

3 decreased by 2
 2 less than 3
 3 minus 2
 etc.

2. Suppose y is located at the point on the number line below. Create the points representing $y + 4$, $y - 4$, and $y - (-2)$.



3. Using the symbol $<$, write an inequality that says "z is less than 12".

$$z < 12$$

SUMMARY (What I learned today)
