

1. Simplify the following, showing all work.

$$9 - 5 \div (8 - 3) \times 2 + 6$$

$$9 - 5 \div 5 \times 2 + 6 \quad 9 - 2 + 6$$

$$9 - 1 \times 2 + 6 \quad 7 + 6$$

$$\boxed{13}$$

2. Define subtraction and division.

add the opposite  
 multiply by the reciprocal

3. What are real numbers?

Numbers on the number line  
 (or the set of all rational and irrational numbers)  
 natural, whole, integers, rational, real

5. Define opposite.

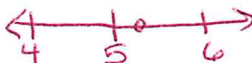
the number on the other side of zero on a number line, equally distant from zero

6. Why isn't  $\sqrt{5}$  a rational number?

cannot be written as the quotient of two integers OR nonterminating, nonrepeating decimal

7. Estimate  $\sqrt{28}$ .

5.3 (or 5.1-5.5)



8. Complete the Output column of the table:

Input	Process	Output
1	$4 \cdot 1 - 2$	2
2	$4 \cdot 2 - 2$	6
3	$4 \cdot 3 - 2$	10
4	$4 \cdot 4 - 2$	14
5	$4 \cdot 5 - 2$	18
6	$4 \cdot 6 - 2$	22
...		...
$n$	$4 \cdot n - 2$	$4n - 2$

9. Write a counterexample for the statement:

The product of two integers is an even number.

Two integers: 3, 7  
 Product:  $3 \cdot 7 = 21 \rightarrow$  odd number  
 $\therefore$  the statement is false.

10. Use an example to show that division is not associative. How could you use the definition of division to make your example associative?

$$(100 \div 20) \div 5 \neq 100 \div (20 \div 5)$$

$$5 \div 5 = 100 \div 4$$

$$1 \neq 25$$

division = multiply by reciprocal

$$(100 \cdot \frac{1}{20}) \cdot \frac{1}{5} = 100 \cdot (\frac{1}{20} \cdot \frac{1}{5})$$

$$5 \cdot \frac{1}{5} = 100 \cdot (\frac{1}{100})$$

$$1 = 1$$

11. Justify each step using the order of operations and properties we've studied.

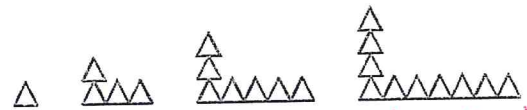
$13 - 25 - 5 + 7$	Given
$13 + (-25) + (-5) + 7$	Definition of Subtraction
$13 + (-30) + 7$	Associative of +
$13 + 7 + (-30)$	Commutative of +
$20 + (-30)$	Order of Operations or PEMDAS
$-10$	PEMDAS or Substitu

12. Name all the integers in the list.

$0, -2, \frac{3}{5}, \pi, \sqrt{7}, 121, \sqrt{9}, \frac{18}{6}$

Integers:  $0, -2, 121, 3, -3$

13. Describe a rule for the pattern.



one triangle is stacked on the left additional and two additional triangles are placed on the right.

14. Name the property of real numbers illustrated by each equation.

a.  $2(3x - y) = 6x - 2y$  Distributive of  $\otimes$  over  $(+)$

b.  $x + (\sqrt{y} + z) = x + (z + \sqrt{y})$   
 Commutative of  $(+)$

15. Write an algebraic expression to model the word phrase.

a. The sum of  $g$  and the quotient of 3 and  $h$   
 $g + \frac{3}{h}$

b. Six times the difference of  $x$  and 22  
 $6(x - 22)$

16. Evaluate the expression for the given value of the variable.

a.  $12x - 9(x - 1); x = 2$   
 $12(2) - 9(2 - 1)$   
 $24 - 9 \cdot 1$   
 $24 - 9$   
 $15$

b.  $\frac{t(2t+3)}{t+6}; t = -2$   
 $\frac{(-2)(2(-2)+3)}{-2+6} = \frac{-2(-4+3)}{4} = \frac{-2(-1)}{4}$   
 $= \frac{2}{4} = \frac{1}{2}$

c.  $x + 7 - x^2; x = 3$   
 $3 + 7 - (3)^2$   
 $3 + 7 - 9$   
 $10 - 9$   
 $1$