

## Reading Mathematical Expressions & Arithmetic Operations

Expression	Reads	Note
$x \in A$	$x$ belongs to $A$ or $x$ is in $A$	Between an element and a set.
$A \subset B$	$A$ is a subset of $B$	Between two sets.
$\emptyset$	The empty set	$\emptyset \neq \{\emptyset\}$
$A \cup B$	$A$ union $B$	
$A \cap B$	$A$ intersection $B$	
$A'$	The complement of $A$	
$a + b = c$	$a$ plus $b$ is equal to $c$	Addition; $c$ is the sum
$a - b = c$	$a$ minus $b$ equals $c$	Subtraction; $c$ is the difference
$a \cdot b = c$	$a$ times $b$ is equal to $c$	Multiplication; $c$ is the product
$a \div b = c$	$a$ divided by $b$ equals $c$	Division; $c$ is the quotient
$\frac{a}{b}, a/b$	$a$ over $b$ or $a$ by $b$	Fraction $a$ : numerator $b$ : denominator
$\frac{1}{2}, \frac{1}{3}, \frac{1}{4}$	one half, one third, one fourth	(Reciprocals of 2, 3 and 4)
$\frac{5}{2}, \frac{2}{3}, \frac{7}{10}$	five halves, two thirds , seven tenths	
$a^b$	$a$ to the $b$ , $a$ to the $b^{\text{th}}$ Power	$a$ : base, $b$ : exponent
$a^2, a^3, a^{-1}$	$a$ squared, $a$ cubed, $a$ inverse	
$\sqrt[n]{a}$	The $n^{\text{th}}$ root of $a$	$n^{\text{th}}$ radical, $a$ - radicand, $n$ - index
$\sqrt{a}, \sqrt[3]{a}$	Square root of $a$ , cube root of $a$	
	$a$ is less than $b$	Inequalities
$a \leq b$	$a$ is less than or equal to $b$	
	$a$ is greater than $b$	
$a \geq b$	$a$ is greater than or equal to $b$	

**Question 1:** Given:  $x = \frac{1}{9}$ ,  $y = -5$  and  $w = -\frac{5}{7}$ . Find:

$\frac{x}{y} =$	$2x^2 =$	$(2x)^2 =$
$x - 5y =$	$x + y =$	$\frac{y}{x} =$
$y + \frac{x}{w} =$	$w - x \cdot y =$	$\frac{2x - 2}{2w} =$
$\frac{2x - 3y}{2w} =$	$2w - 3(3y - 2x) =$	$7\frac{1}{5} - 4\frac{1}{8} \div 1\frac{1}{4} =$

**Answer:**

$\frac{x}{y} = -\frac{1}{45}$	$2x^2 = \frac{2}{81}$	$(2x)^2 = \frac{4}{81}$
$x - 5y = \frac{226}{9}$	$x + y = -\frac{44}{9}$	$\frac{y}{x} = -45$
$y + \frac{x}{w} = -\frac{232}{45}$	$w - x \cdot y = -\frac{10}{63}$	$\frac{2x - 2}{2w} = \frac{56}{45}$
$\frac{2x - 3y}{2w} = -\frac{959}{90}$	$2w - 3(y - 2x) = \frac{929}{21}$	$7\frac{1}{5} - 4\frac{1}{8} \div 1\frac{1}{4} = \frac{39}{10}$

**Question 2:** Find:

<b>(a):</b> $1.32 + 0.132 =$	<b>(e):</b> $26.06 \div 25 =$
<b>(b):</b> $1.05 - 100.3 =$	<b>(f):</b> $1.5 \div 0.15 =$
<b>(c):</b> $(0.2)^2 - (0.07)^2 =$	<b>(g):</b> $12 \div 1.44 =$
<b>(d):</b> $3 - (0.12)^2 =$	<b>(h):</b> $\frac{1.2 \times 1.04}{0.06} =$

**Answer:**

<b>(a):</b> $1.32 + 0.132 = 1.452$	<b>(e):</b> $26.06 \div 25 = 1.0424$
<b>(b):</b> $1.05 - 100.3 = -99.25$	<b>(f):</b> $1.5 \div 0.15 = 10$
<b>(c):</b> $(0.2)^2 - (0.07)^2 = 0.0351$	<b>(g):</b> $12 \div 1.44 = \frac{25}{3}$
<b>(d):</b> $3 - (0.12)^2 = 2.9856$	<b>(h):</b> $\frac{1.2 \times 1.04}{0.06} = 20.8$

**Question 3:** Answer the following:

1. Which is larger  $\pi$  or  $\frac{22}{7}$ ? Why? ( $\pi \approx 3.14159$ )
2. Which is smaller  $\frac{8}{11}$  or  $\frac{7}{9}$ ? Why?
3. Calculate and give the remainder of  $2606 \div 25$ .
4. Express  $\frac{115}{40}$  and  $\frac{147}{28}$  as a decimal numbers.
5. Express 0.62 as a fraction in its lowest terms.
6. Find reciprocal of the mixed number  $-2\frac{3}{5}$
7. Find (a):  $\sqrt{1521}$       (b):  $\sqrt{30.25}$       (c):  $\sqrt{0.25-0.16}$

**Answer:**

1.  $\frac{22}{7}$  because  $\frac{22}{7} = 3.\overline{142857}$
2.  $\frac{8}{11}$  because  $\frac{8}{11} = \frac{8(9)}{11(9)} = \frac{72}{99}$  and  $\frac{7}{9} = \frac{7(11)}{9(11)} = \frac{77}{99}$
3. **Answer:**  $2606 \div 25 = 104 + \frac{6}{25}$  The remainder is 6
4.  $\frac{115}{40} = 2.875$  and  $\frac{147}{28} = 5.25$
5.  $0.62 = \frac{31}{50}$  because  $0.62 = \frac{0.62}{1} = \frac{62}{100} = \frac{2(31)}{2(50)} = \frac{31}{50}$
6.  $-\frac{5}{13}$  because  $-2\frac{3}{5} = -\left(2\frac{3}{5}\right) = -\left(2 + \frac{3}{5}\right) = -\frac{13}{5}$
7. (a): 39      (b): 5.5      (c): 0.3