Some Basics Facts

This section will cover the following topics

Notation

Order of Operations

Notation

Math is a language of its own. It has vocabulary and punctuation (notation) just like any other language. To help you get ready for the placement exam, here is a list of some important notation to know.

<table>
<tr><th>Notation</th><th>Description</th></tr>
<tr><td>Multiplication</td><td>Multiplication can be expressed by the symbols $\times$, $\cdot$, $*$, or $(\,)$.

Examples
<table>
<tr><td>$\times$</td><td>$5 \times 2 = 10$</td></tr>
<tr><td>$\cdot$</td><td>$5 \cdot 2 = 10$</td></tr>
<tr><td>$*$</td><td>$5 * 2 = 10$</td></tr>
<tr><td>$(\,)$</td><td>$5(2)$</td></tr>
</table></td></tr>
<tr><td>Division</td><td>Division can be expressed by the symbols $\div$, $/$, $-$, or $\overline{)}$.

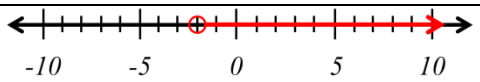
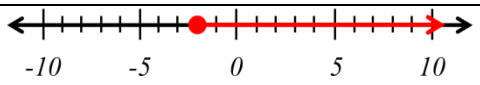
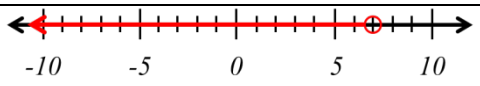
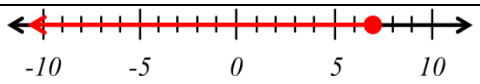
Examples
<table>
<tr><td>$\div$</td><td>$10 \div 2 = 5$</td></tr>
<tr><td>$/$</td><td>$10/2 = 5$</td></tr>
<tr><td>$\frac{a}{b}$</td><td>$\frac{10}{2} = 5$</td></tr>
</table>
$$\begin{array}{r} 5 \\ 2\overline{)\,10} \\ -\underline{10} \\ 0 \end{array}$$</td></tr>
<tr><td>Exponents</td><td>Exponents is a shortcut for multiplication. For example, 3^4 is a shortcut way of saying, “multiply 3 by itself 4 times.” In other words,

$$3^4 = 3 \times 3 \times 3 \times 3 = 81$$</td></tr>
<tr><td>Square Roots</td><td>The square root symbol is $\sqrt{\ }$. It means the number that, when multiplied by itself, results in the value inside the root. For example, $\sqrt{4} = 2$ because $2 \times 2 = 4$

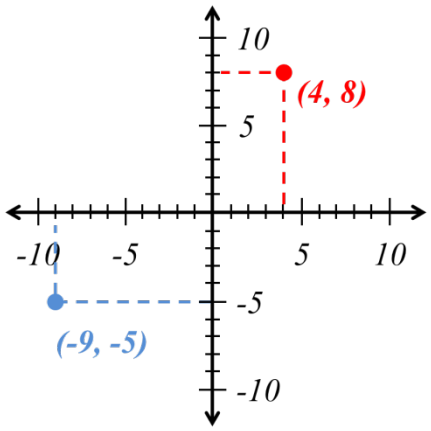
Common Roots
<table>
<tr><td>$\sqrt{1} = 1$</td><td>$\sqrt{4} = 2$</td><td>$\sqrt{9} = 3$</td><td>$\sqrt{16} = 4$</td><td>$\sqrt{25} = 5$</td><td>$\sqrt{36} = 6$</td></tr>
<tr><td>$\sqrt{49} = 7$</td><td>$\sqrt{64} = 8$</td><td>$\sqrt{81} = 9$</td><td>$\sqrt{100} = 10$</td><td>$\sqrt{121} = 11$</td><td>$\sqrt{144} = 12$</td></tr>
</table></td></tr>
</table>

A Quick Tip

Even if you have not done math for a long time you are likely to remember a considerable amount. Taking just a few minutes reviewing notation can help you avoid missing problems you already know.

Notation	Description
Inequalities and interval notation	**Greater Than** Inequality: $x > -2$ | Interval Notation: $(-2, \infty)$ | Number Line:  Note: the ">" in > -2 , the "(" in $(-2, \infty)$, and the hollow "○" mean include every number bigger than -2 *BUT NOT* -2 itself. For example, driving strictly faster than the speed limit may get you a ticket, but driving at the speed limit will not. **Greater Than or Equal To** Inequality: $x \geq -2$ | Interval Notation: $[-2, \infty)$ | Number Line:  Note: the "≥" in $x \geq -2$, the "[" in $[-2, \infty)$, and the solid "●" mean include every number bigger than -2 *AND* -2 itself. The standard legal age for getting a driver's license is 16 or older. The age of 16 is included. **Less Than** Inequality: $x < 7$ | Interval Notation: $(-\infty, 7)$ | Number Line:  **Less Than or Equal To** Inequality: $x \leq 7$ | Interval Notation: $(-\infty, 7]$ | Number Line: 

Notation	Description

Graphing Points in a Plane	Points are written in the form of (x, y), which is called an "ordered pair." The x represents the left-right distance from the center of the plane, while the y represents the up-down distance from the center	

Order of Operations

PEMDAS		Description
1	P = Parentheses	In this case, the term parentheses will include anything that would be considered a grouping symbol such as [ ], which are called square brackets. Also included in this list is the fraction line. For example, in the fraction $\frac{5+3}{2+7}$ first focus on the numerator and denominator separately to get $\frac{5+3}{2+7} = \frac{8}{9}$
2	E = Exponents	Exponents are a shortcut for multiplication. 2^4 means multiply 2 by itself 4 times.
3 *4*	M = Multiplication And D = Division	Multiplication and Division are considered the same in the order of operations. It is important to note, however, that they should be done left to right. **Example 1**: $10 \div 2 \times 3 = 5 \times 3 = 15$ **Example 2**: $6 \times 3 \div 2 = 18 \div 2 = 9$
5	A = Addition And S = Subtraction	As with multiplication and division, Addition and Subtraction are considered the same. They are also approached left to right. **Example 1**: $10 - 2 + 3 = 8 + 3 = 11$ **Example 2**: $6 + 3 - 2 = 9 - 2 = 7$

Practice Problems

1. $3 + 4 \cdot 5 - 6$	2. $3^2 + 4 * 5 - 6 \div 2$
3. $3^2 + 4 * (6 - 2) - 5$	4. $\frac{3+5*2}{4*6-9}$

Answers

1. 17	2. 26
3. 20	4. $\frac{13}{15}$

Additional Help

You can also search YouTube.com for “order of operations”