WOCOMAL (Worcester County Math League) Mathematical Conventions

Instructions embedded in the question supersede this document for that specific question.

Answers should be simplified and exact. See the table of examples that follows.

When there is no mathematical consensus about which of several answers is "most simplified", any of them will be accepted: for example, $\frac{3}{2}$, $1\frac{1}{2}$, or 1.5 are all acceptable unless the problem mandates a certain form. In particular:

Fractions must be completely reduced. The numerator and denominator must be relatively prime.

All radicals must be simplified, *i.e,* square roots must be 'square-free', cube roots must be 'cube-free', *etc*.

Where possible denominators must be rationalized. (however, $\frac{1}{\pi}$ would be left as is).

Answers involving pi (π) and other irrational numbers are to be in exact form.

Units of any answer, if required, must be the same as the units asked for in the statement of the problem. For example, if the problem requests degrees then the answer must be in degrees.

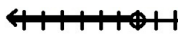
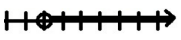
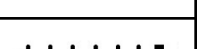
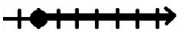
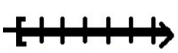
When a question calls for an "ordered pair (*a*, *b*)," the answer must be given precisely in that form, including the parentheses and the comma. The same applies for other choices of letters and for ordered *n*-tuples.

If complex answers are used *i* will stand for $\sqrt{-1}$.
If an answer is asked for in complex form it should be in the form, *a* + *bi.*

If a ratio a : b is requested then a colon (:) will be placed on the answer blank. The corresponding fraction $\frac{a}{b}$ must be in simplified form with a rationalized denominator, whenever possible, and presented in the form *a* : *b*.

When calculators are allowed, all answer must either be exact ($\sqrt{3}$), or written in decimal form rounded to three significant figures. The calculator answer for $\sqrt{3}$ is 1.732; it is not 2 nor 1.7 nor 1.73 nor 1.7321 nor 1.7320.

United States currency should be presented in $ (dollars) using the $ symbol followed by a whole number or an answer with exactly two places to the right of the decimal point. If the amount is less than one dollar then the amount may also be represented by the number of ¢ (cents) followed by the ¢ symbol.

Symbol	Meaning	Numberline Symbols		Numberlines	
		Closed or open circle	Parenthesis or square bracket		
<	is less than	Open ○	)		
>	is greater than	Open ○	(		
≤	is less than or equal to	Closed circle ●	]		
≥	is greater than or equal to	Closed circle ●	[		

Answers must be legible. If the answer is not clearly written, it will probably be marked wrong. Stray marks should be erased, so that they are not considered decimal points or negative signs. Unreasonable calculations do not need to be carried out.

Table of Acceptable Answer Examples

Not Simplified, Not acceptable	Simplified and Acceptable
$\frac{6}{4}$	$\frac{3}{2}$
5 + 2	7
2^7	128
6!	720
$\binom{9}{8}$	9
24×16	384
$4 - 1 + 3 \times 2^{16}$	$3 + 3 \times 2^{16}$, $3(1 + 2^{16})$
$\frac{2^{50} - 2^{40}}{12}$	$\frac{2^{48} - 2^{38}}{3}$, $\frac{2^{38}(2^{10} - 1)}{3}$
$\sqrt{12}$	$2\sqrt{3}$
$\frac{4}{\sqrt{2}}$	$2\sqrt{2}$
$\sqrt{\frac{5}{4}}$	$\frac{\sqrt{5}}{2}$
$\sqrt[4]{\frac{5}{4}}$	$\frac{\sqrt[4]{20}}{2}$
$\sqrt{6.75}$	$\frac{3\sqrt{3}}{2}$
$\frac{1}{1+\sqrt{2}}$	$-1 + \sqrt{2}$
$\frac{5}{1+2i}$	$1 - 2i$
$1 + \sqrt{-3}$	$1 + i\sqrt{3}$

Not Simplified, Not acceptable	Simplified and Acceptable
Complex form $a + bi$ specified: $3i$ 5	Complex form $a + bi$ specified: $0 + 3i$ $5 + 0i$
$2 \sin 30^o$	1
$\cos\frac{\pi}{2}$	0
$\sin(2\arcsin(\frac{5}{13}))$	$\frac{120}{169}$
\$2.1; 2.10\$ \$7.0; \$7.000; 7\$ \$19/4; $\$\frac{19}{4}$ ¢83 126¢	\$2.10 \$7; \$7.00 \$4.75 \$.83; \$0.83; 83¢ \$1.26

Simplified and Acceptable	General Case Simplified and Acceptable(Conditions)
$\frac{3}{2}$	$\frac{a}{b}$, a, b are relatively prime
10!	$m!$ $m > 7$
7^6	m^n, $m > 5$ and $n > 5$ is simplified
$\begin{pmatrix} 18 \\ 7 \end{pmatrix}$	$\begin{pmatrix} n \\ r \end{pmatrix}$, $n - r > 10$ and $r > 5$
$72 \times 73 \times 74$	products > 100,000
$\cos\left(\frac{\pi}{11}\right)$	trigonometric functions where $\frac{a\pi}{b}$ can not be found using reasonable half angle and double angle formulas