

How do you want me to simplify this?

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My (admittedly perverse) answer is that “to simplify” means to write an equivalent expression that the instructor/marker likely wants or expects as an answer. It is an exercise in mind-reading.

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Quick guide to simplifying

- (a) Reduce all rational numbers to lowest terms.
- (b) All arithmetic in sums, products, and exponents should be done.
- (c) All common additive and multiplicative terms should be combined.
- (d) For any real valued expression, use the identities $1 \times x = x$, $0x = 0$, $1^x = 1$ and $x^1 = x$ to replace the left side by the right side.
- (e) Provided x is a nonzero and real valued expression, use the identities $\frac{x}{x} = 1$, $x^0 = 1$ to replace the left side by the right side.
- (f) Provided x is a nonnegative and real valued expression, use the identity $(x^a)^b = x^{ab}$ to replace the left side by the right side.
- (g) Use the well known values of the trigonometric functions at the integer multiples of $\pi/6$ and $\pi/4$ to simplify these values.
- (h) For any odd function O , replace $O(x) + O(-x)$ by zero. For any even function E , replace $E(x) - E(-x)$ by zero.
- (i) Use the well known values of the logarithms to simplify these values.
- (j) For a positive integer n , replace $\frac{1}{\sqrt{n}}$ by $\frac{\sqrt{n}}{n}$.
- (k) For a positive integers m and n , replace $\sqrt{mn^2}$ by $n\sqrt{m}$.

¹ Professor Emeritus at Simon Fraser University; see <https://www.quora.com/What-does-it-mean-to-simplify-an-expression?share=1>