

1. A quantity of an ideal gas had initial pressure of 0.03×10^9 atmospheres, initial volume of $0.007 \times 10^{-2} \text{ cm}^3$, and initial temperature of 7000 kelvins. Find the final temperature if the final pressure was 3000×10^3 atmospheres and the final volume was $30,000 \text{ cm}^3$. Solve the equation for T_2 as the first step.
2. An 80% iodine solution is to be mixed with a 40% iodine solution. How much of each should be used to get 12,000 milliliters of a 64% iodine solution?
3. Find three consecutive negative integers such that 3 times the product of the first and third exceeds twice the product of the first and second by 32.

Simplify:

4. $\frac{2}{2\sqrt{3} + 4}$

5. $6\sqrt{\frac{7}{5}} - 2\sqrt{\frac{5}{7}} - 3\sqrt{140}$

6. $\sqrt[5]{a^2 y^6} \sqrt[3]{ay^2}$

Add:

7. $\frac{3}{x + 3} - \frac{2x + 1}{x^2 - 9}$

8. $7\angle -45^\circ + 7\angle 225^\circ$

9. Write $3R - 2U$ in polar form.

10. Solve: $R_C T_C = 360$, $R_M T_M = 480$, $R_M = 2R_C$, $T_M + T_C = 15$

Simplify:

11. $x + \frac{3b}{x + \frac{2}{b}}$

12. $(3i - 2)(5i - 3) - \sqrt{-3}\sqrt{-3} + 3i^2 - i^3$

13. Solve: $\begin{cases} \frac{1}{5}x - \frac{5}{2}y = -48 \\ 0.4x + 0.05y = 5 \end{cases}$

14. Solve by completing the square: $7 = 3x - 2x^2$

15. Solve: $\frac{4x + 5}{3} + 2 = \frac{x}{7}$

16. Use unit multipliers to convert 7 cubic yards per second to cubic feet per minute.

17. Find x : $ay = b\left(\frac{c}{x + e} + \frac{3f}{h}\right)$

18. Find the equation of the line that passes through $(5, -3)$ and is parallel to the line $3x + 4y = 8$.

19. Use a calculator to simplify. Estimate first.

(a) $\frac{373,402 \times 10^{10}}{97,376 \times 10^{-4}}$

(b) $\sqrt[4.3]{207}$

20. Given: $m\widehat{XY} = 110^\circ$.
 $\triangle XYZ$ is isosceles with
 $\overline{XZ} = 20$ and $\overline{XY} = 16$.
 Find: $m\widehat{XZ}$, $m\widehat{YZ}$, and the area of $\triangle XYZ$.

