

1. Find a rational number that is halfway between $-1 \frac{2}{3}$ and $4 \frac{1}{2}$. EXPRESS YOUR ANSWER IN DECIMAL FORM.
2. If $9x = 5x - 8c + 6$, what is the value of $6x + 5c$ in terms of c ?
3. GIVEN THE FOLLOWING SYSTEMS:

$$\begin{array}{l} 2x - 5y = -3 \\ 2y = -3x + 5 \end{array} \quad \text{and} \quad \begin{array}{l} 8a = 6b \\ 6a + 9b = -3 \end{array}$$
 FIND $x - 2y + 4a - 3b$
4. $(3x - 1)(2x + 3)(x - 2)(x - 5) = Ax^4 + Bx^3 + Cx^2 + Dx + E$
 FIND $A + B + C + D + E$.
5. For all positive numbers m and n , let operation $*$ and $\#$ be defined as $m * n = 2n$ and $m \# n = n/m$. If x and y are positive, then

$$[x * (3y)] \# 7 = ?$$
6. A scientist has 200 mL of a solution that is 40% acid. How many milliliters of water should be added to make a solution that is 25% acid?
7. Let $x =$ the sum of the solutions to $2x^2 - 7x - 15 = 0$.
 Let $y =$ the remainder of $(x^3 + 11x^2 + 11x + 6) \div (x+3)$.
 Find the value of $4x + 5y$.
8. EVALUATE: $5233^2 - 5213^2$
9. In a video game, a little monster moving at a constant speed gobbles k animals in t seconds. At this rate, how many minutes does it take the little monster to gobble 1000 animals?

10. EVALUATE for $x = \frac{3}{2}$

$$\frac{\frac{8}{2x - 4} + 1}{2(x^2 - 10) + \frac{(-x^3 + 8)}{x + 4}}$$

11. Solve the inequality:

$$\frac{2m - 8}{m} < \frac{4}{m}$$

12. SIMPLIFY the following expression:

$$\frac{2x - 6}{2x - 10} \cdot \left(\frac{x^3 - 27}{3x^2 - 75} \right)^{-1} \div \frac{3x + 5}{2x^2 + 6x + 18}$$

13. What is the units digit of the simplified form of 1987^{1987} ?

14. Solve for x:

$$\sqrt{\sqrt{x + 37} + 2} + 6 = 3$$

15. Find the equation of the line that is perpendicular to the line $2x - 3y = 9$ and passes through the point $(4, 3)$.