Find the value for the variable that makes the statement true. (SHOW WORK NEATLY)

1. \(2y - 4 + 5y = 4 - 3y + 5\)

\[7y - 4 = 9 - 3y\]
\[+3y\]
\[10y - 4 = 9\]
\[+4\]
\[10y = 13\]
\[\frac{10y}{10} = \frac{13}{10}\]
\[y = 1.3\]

Example: \(2(3x - 4) = 5\)
\[6x - 8 = 5\]

II. Eliminate fractions by multiplying each term by the lowest common denominator.

3. \(-7x = 91\)
\[\frac{-7}{-7}\]
\[x = -13\]

Example: \(\frac{1}{3}x - \frac{1}{2} = \frac{x}{4}\)

\(\frac{1}{3}x - \frac{1}{2} = \frac{x}{4}\)

4. \(123 = 3m\)
\[\frac{123}{3} = \frac{3m}{3}\]
\[x = 41\]

Example: \(\frac{1}{3}x - \frac{1}{2} = \frac{x}{4}\)

\(\frac{1}{3}x - \frac{1}{2} = \frac{x}{4}\)

5. \(\frac{2}{3}x = 12\)
\[\frac{3}{3} \cdot \frac{2}{3}x = 3 \cdot 12\]
\[\frac{2x}{2} = 36\]
\[x = 18\]

Example: \(4x - 6 = 3x\)

\(4x - 6 = 3x\)

III. Combine like terms on each side of the equation.

6. \(3x + 2 = 14\)
\[\frac{-2}{-2}\]
\[\frac{3x}{3} = \frac{12}{3}\]
\[x = 4\]

Example: \(4x + 2 - 7x = 2 + x + 8\)
\[\frac{-3x + 2 = 10 + x}{-3x + 2 = 10 + x}\]

7. \(2a - 6 = 5a\)
\[\frac{-2a}{-2a}\]
\[\frac{-6}{3} = \frac{3a}{3}\]
\[-2 = a\]

Example: \(\frac{3x + 2 = 6x - 5}{-3x + 2 = 3x - 5}\)
\[\frac{+5}{+5}\]
\[\frac{2 = 3x - 5}{7 = 3x}\]

8. \(32 = -8 - 10b\)
\[\frac{+8}{+8}\]
\[\frac{40 = -10b}{-10 = -10}\]
\[-4 = b\]

Example: \(\frac{3x + 2 = 6x - 5}{-3x + 2 = 3x - 5}\)
\[\frac{+5}{+5}\]
\[\frac{2 = 3x - 5}{7 = 3x}\]

IV. Move the "variable" term to one side of the equation and the constants to the other side using addition or subtraction.

9. \(3(m - 4) + 2m = 8\)
\[\frac{3m - 12 + 2m = 8}{\text{Combine like terms}}\]
\[\frac{5m - 12 = 8}{\text{Add 12 to both sides}}\]
\[\frac{5m}{5} = \frac{20}{5}\]
\[M = 4\]

Example: \(\frac{4x = 12}{\text{Divide both sides by 4}}\)
\[\frac{4x}{4} = \frac{12}{4}\]
\[x = 3\]
11. \(2(w - 3) - 2w = 7\)

\[
2w - 6 - 2w = 7
\]

\[
-6 = 7
\]

FALSE STATEMENT

12. \(3(2a + 3) - 2a = 2(5 + 2a) - 1\)

\[
6a + 9 - 2a = 10 + 4a - 1
\]

\[
4a + 9 = 9 + 4a
\]

\[
-4a
\]

TRUE STATEMENT

\[a = \text{all real numbers (R)}\]

---

I. Eliminate parenthesis by distributing.

\[
2(3x - 4) = 5
\]

\[
6x - 8 = 5
\]

II. Eliminate fractions by multiplying each term by the lowest common denominator.

\[
 \frac{1}{3}x - \frac{1}{2} = \frac{x}{4}
\]

\[
4x - 6 = 3x
\]

III. Combine like terms on each side of the equation.

\[
4x + 2 - 7x = 2 + x + 8
\]

\[
-3x + 2 = 10 + x
\]

IV. Move the "variable" term to one side of the equation and the constants to the other side using addition or subtraction.

\[
3x + 2 = 6x - 5
\]

\[
\frac{2}{3}x = 5
\]

\[
7 = 3x
\]

V. Divide both sides by the coefficient (the number in front of the variable).

\[
4x = 12
\]

\[
\frac{4x}{4} = \frac{12}{4}
\]

\[
x = 3
\]
17. \( \frac{1}{2} x - \frac{4}{6} = \frac{5}{2} x + 5 \)
18. \( 3t + 4x = 6 - 2x \) (solve for \( t \))

\[
\begin{align*}
\frac{3}{2} x - 2 &= \frac{5}{2} x + 5 \\
-\frac{3}{2} x - 2 &= \frac{5}{2} x + 2 \cdot 5
\end{align*}
\]

\[
\begin{align*}
3x - 4 &= 5x + 10 \\
-3x &= 2x + 10 \\
-4 &= 2x + 10 \\
-10 &= -10
\end{align*}
\]

\[
\begin{align*}
-14 &= 2x \\
-7 &= x
\end{align*}
\]

19. \( 2(x + 2y) - 2 = 3x + 3 \) (solve for \( y \))
20. \( a x + 2b = 5b - c \) (solve for \( b \))

\[
\begin{align*}
2x + 4y - 2 &= 3x + 3 \\
2x - 2x &= 1x + 3 \\
4y &= x + 3 \\
4y &= x + 5 \\
4 &= 4
\end{align*}
\]

\[
\begin{align*}
x + 5 &= 4 \\
\frac{x}{4} + \frac{5}{4} &= y
\end{align*}
\]

\[
\begin{align*}
ax &= 3b - c \\
ax + c &= 3b
\end{align*}
\]

21. If \( 3a + 1 - a = 9 \) then what is the value of \( 5a + 2 \)?

\[
\begin{align*}
2a + 1 &= 9 \\
\frac{2a}{2} &= \frac{8}{2} \\
a &= 4
\end{align*}
\]

VI. Eliminate parenthesis by distributing.

\[
2(3x - 4) = 5
\]

\[
6x - 8 = 5
\]

VII. Eliminate fractions by multiplying each term by the lowest common denominator.

\[
\frac{1}{3} x - \frac{1}{2} = \frac{x}{4}
\]

\[
4x - 6 = 3x
\]

VIII. Combine like terms on each side of the equation.

\[
4x + 2 - 7x = 2 + x + 8
\]

\[
-3x + 2 = 10 + x
\]

IX. Move the "variable" term to one side of the equation and the constants to the other side using addition or subtraction.

\[
\begin{align*}
3x + 2 &= 6x - 5 \\
-3x &= 3x - 5 \\
+5 &= +5 \\
7 &= 3x
\end{align*}
\]

X. Divide both sides by the coefficient (the number in front of the variable).

\[
\begin{align*}
4x &= 12 \\
\frac{4x}{4} &= \frac{12}{4} \\
x &= 3
\end{align*}
\]
22. \( \frac{2x+1}{3} = \frac{x+1}{2} \)

\[ 2(2x+1) = (x+1)3 \]

\[ 4x + 2 = 3x + 3 \]

\[ -3x + 2 = 3 \]

\[ x = 1 \]

23. \( \frac{x+1}{3} + \frac{2x-1}{2} = \frac{3x-1}{6} \)

\[ 2(x+1) + 3(2x-1) = 3x - 1 \]

\[ 2x + 2 + 6x - 3 = 3x - 1 \]

\[ 8x - 1 = 3x - 1 \]

\[ 5x = 0 \]

\[ x = 0 \]

24. \( 2^4 = 64 \)

\[ 2^1 = 2 \]

\[ 2^2 = 2 \cdot 2 = 4 \]

\[ 2^3 = 2 \cdot 2 \cdot 2 = 8 \]

\[ 2^4 = 2 \cdot 2 \cdot 2 \cdot 2 = 16 \]

\[ 2^5 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = 32 \]

\[ 2^6 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = 64 \]

\[ x = 6 \]

25. \( 3^4 = 243 \)

\[ 3^1 = 3 \]

\[ 3^2 = 3 \cdot 3 = 9 \]

\[ 3^3 = 3 \cdot 3 \cdot 3 = 27 \]

\[ 3^4 = 3 \cdot 3 \cdot 3 \cdot 3 = 81 \]

\[ 3^5 = 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 = 243 \]

\[ x = 5 \]

26. \( 5^3 = 125 \)

\[ 5^1 = 5 \]

\[ 5^2 = 5 \cdot 5 = 25 \]

\[ 5^3 = 5 \cdot 5 \cdot 5 = 125 \]

\[ x = 3 \]