

Properties of Real Numbers Assignment

Name the property of real numbers used in each equation. Then find the value of x .

1. $0.75 + 0 = x$
2. $0 = 2 + x$
3. $0.52 + 0.15 = 0.52 + x$
4. $(9 + 7) + 5 = 9 + (7 + x)$
5. $21x = 21$
6. $2x = 0$
7. $1 = 13x$
8. $x + 25 = 25 + 10$
9. $(8 \cdot 3) \cdot 9 = x \cdot (3 \cdot 9)$
10. $12 - 3 = x + 12$

Evaluate each expression if $x = 4$, $y = 3$ and $z = 6$. (Name the property used in each step.)

11. $\frac{3}{x}[x \div (7 - x)]$
12. $2(y \cdot 2 - 5) + y \cdot \frac{1}{y}$
13. $z \cdot \frac{1}{z} + 5(2z \div 4 - 3)$
14. $y\frac{y}{7} \cdot 14 \cdot 1\frac{1}{4}$
15. $\frac{1}{x} + 2 + 2\frac{3}{x}$
16. $2x + \frac{3}{5}\left(\frac{1}{2}x + 2y\right) + \frac{2}{y}$
17. $3.2(x + y) + 2.3(x + y) + 4x$
18. $(4x^2 + 6x) + (3y^2 + 8y)$

Properties of Real Numbers Assignment

ANSWER

Name the property of real numbers used in each equation. Then find the value of x .

- | | | |
|--|--------------------|--|
| 1. $0.75 + 0 = x$ | $x = 0.75$ | Additive identity property |
| 2. $0 = 2 + x$ | $x = -2$ | Additive inverse property |
| 3. $0.52 + 0.15 = 0.52 + x$ | $x = 0.15$ | Commutative property of addition |
| 4. $(9 + 7) + 5 = 9 + (7 + x)$ | $x = 5$ | Associative property of addition |
| 5. $21x = 21$ | $x = 1$ | Multiplicative identity property |
| 6. $2x = 0$ | $x = 0$ | Multiplicative property of zero |
| 7. $1 = 13x$ | $x = \frac{1}{13}$ | Multiplicative inverse property |
| 8. $x + 25 = 25 + 10$ | $x = 10$ | Commutative property of addition |
| 9. $(8 \cdot 3) \cdot 9 = x \cdot (3 \cdot 9)$ | $x = 8$ | Associative property of multiplication |
| 10. $12 - 3 = x + 12$ | $x = -3$ | Commutative property of addition |

Evaluate each expression if $x = 4$, $y = 3$ and $z = 6$. (Name the property used in each step.)

11. $\frac{3}{x}[x \div (7 - x)]$ $\frac{3}{4}[4 \div (7 - 4)]$ Substitution

$= \frac{3}{4}[4 \div 3] = \frac{3}{4} \cdot \frac{4}{3}$ Subtraction (Grouping)

$= 1$ Multiplicative inverse

12. $2(y \cdot 2 - 5) + y \cdot \frac{1}{y}$ $= 2(3 \cdot 2 - 5) + 3 \cdot \frac{1}{3}$ Substitution

$= 2(3 \cdot 2 - 5) + 1$ Multiplicative inverse

$= 2(6 - 5) + 1$ Multiply

$= 2(1) + 1$ subtract

$= 2 + 1$ Multiplicative identity

$= 3$ Add

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13. $z \cdot \frac{1}{z} + 5(2z \div 4 - 3) = 6 \cdot \frac{1}{6} + 5(2(6) \div 4 - 3)$ Substitution

$= 1 + 5(2(6) \div 4 - 3)$ Multiplicative inverse

$= 1 + 5(12 \div 4 - 3)$ Multiply

$= 1 + 5(3 - 3)$ Divide

$= 1 + 5(0)$ Subtract

$= 1 + 0$ Multiplicative property of zero

$= 1$ Addition identity

14. $y \frac{y}{7} \cdot 14 \cdot 1 \frac{1}{4} = 3 \frac{3}{7} \cdot 14 \cdot 1 \frac{1}{4}$ Substitution

$= \frac{24}{7} \cdot 14 \cdot \frac{5}{4}$ Improper fraction

$= \frac{(4 \cdot 6)}{7} \cdot (2 \cdot 7) \cdot \frac{5}{4}$ Symmetric

$= \frac{(1 \cdot 6)}{1} \cdot (2 \cdot 1) \cdot \frac{5}{1}$ Multiplicative inverse

$= 6 \cdot 2 \cdot 5$ Simplified

$= 60$ Multiply

15. $\frac{1}{x} + 2 + 2 \frac{3}{x} = \frac{1}{4} + 2 + 2 \frac{3}{4}$ Substitution

$= \frac{1}{4} + 2 + \frac{11}{4}$ Improper fraction

$= \frac{1}{4} + \frac{11}{4} + 2$ Associative (addition)

$= \frac{12}{4} + 2$ Add

$= 3 + 2$ Divide

$= 5$ Add

Properties of Real Numbers Assignment

$$\begin{aligned}
 16. \quad 2x + \frac{3}{5}\left(\frac{1}{2}x + 2y\right) + \frac{2}{y} &= 2(\textcolor{red}{4}) + \frac{3}{5}\left(\frac{1}{2}(\textcolor{red}{4}) + 2(\textcolor{red}{3})\right) + \frac{2}{\textcolor{red}{3}} && \text{Substitution} \\
 &= \textcolor{red}{8} + \frac{3}{5}(\textcolor{blue}{2} + \textcolor{red}{6}) + \frac{2}{\textcolor{red}{3}} && \text{Multiply and divide} \\
 &= \textcolor{red}{8} + \frac{3}{5}(\textcolor{red}{8}) + \frac{2}{3} && \text{Add} \\
 &= \textcolor{red}{8} + \frac{\textcolor{red}{24}}{5} + \frac{2}{3} && \text{Multiply} \\
 &= \frac{\textcolor{red}{120}}{\textcolor{red}{15}} + \frac{\textcolor{red}{72}}{\textcolor{red}{15}} + \frac{\textcolor{red}{10}}{\textcolor{red}{15}} && \text{LCD} \\
 &= \frac{\textcolor{red}{202}}{\textcolor{red}{15}} && \text{Add}
 \end{aligned}$$

$$\begin{aligned}
 17. \quad 3.2(x + y) + 2.3(x + y) + 4x &= 3.2(\textcolor{red}{4} + \textcolor{red}{3}) + 2.3(\textcolor{red}{4} + \textcolor{red}{3}) + 4(\textcolor{red}{4}) && \text{Substitution} \\
 &= 3.2(\textcolor{red}{7}) + 2.3(\textcolor{red}{7}) + 4(\textcolor{red}{4}) && \text{Add} \\
 &= \textcolor{red}{22.4} + \textcolor{red}{16.1} + \textcolor{red}{16} && \text{Multiply} \\
 &= \textcolor{red}{54.5} && \text{Add}
 \end{aligned}$$

$$\begin{aligned}
 18. \quad (4x^2 + 6x) + (3y^2 + 8y) &= (4(\textcolor{red}{4})^2 + 6(\textcolor{red}{4})) + (3(\textcolor{red}{3})^2 + 8(\textcolor{red}{3})) && \text{Substitution} \\
 &= (4(\textcolor{red}{16}) + \textcolor{red}{24}) + (3(\textcolor{red}{9}) + \textcolor{red}{24}) && \text{Multiply} \\
 &= (64 + 24) + (27 + 24) && \text{Multiply} \\
 &= \textcolor{red}{88} + \textcolor{red}{51} && \text{Add} \\
 &= \textcolor{red}{139} && \text{Add}
 \end{aligned}$$