Categories of Equations

Linear Equation: The variables on either side are no higher than degree 1.

Conditional: When it is true only for some values of the variables. Ex. 8x = 16 is conditional because it is only true when x = 2

Identities: Always true for defined variables. Ex. 4x + 2x = 6x because it will always work regardless of x’s value.

Contradiction: an equation with no variables that is untrue. Ex. 1 = 0 these have “empty slots”

Properties of Equality

Addition Property of Equality: For all a, b, and c, If a = b, then a + c = b + c

Subtraction Property of Equality: For all a, b, and c, If a = b, then a - c = b - c

Multiplication Property of Equality: For all a, b, and c, If a = b, then ac = bc

Division Property of Equality: For all a, b, and c, If a = b, then a/c = b/c

**Justify**

|  |  |
| --- | --- |
| 9 = x + 2  -2 - 2  7 = x  1/4x = 3  ×4 ×4  X = 12  7x + 5 = 33  -5 -5  7x = 28  /7 /7  x = 4  6x – 3 = 2x + 21  + 3 + 3  6x = 2x + 24  -2x -2x  4x = 24  /4 /4  x = 6 | Given  Subtraction Property of Equality  Given  Multiplicative Inverse + Multiplication Property of Equality  Given  Subtraction Property of Equality  Division Property of Equality  Given  Addition Property of Equality  Subtraction Property of Equality  Division Property of Equality |

( = ) 40

4(x – 5) = 10(x + 4)

4x – 20 = 10x + 40

+20 + 20

4x = 10x + 60

-10x -10x

-6x = 60

x = -10

+ = -

( + = - )12x

(4 • 2) + (3x) = (2 • 11) – (4x)

8 + 3x = 22 – 4x

+4x +4x

8 + 7x = 22

-8 -8

7x = 14

x = 2