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 - 27 = x1/4x = 3×4 ×4X = 127x + 5 = 33 -5 -57x = 28/7 /7x = 46x – 3 = 2x + 21 + 3 + 36x = 2x + 24-2x -2x4x = 24/4 /4x = 6 | GivenSubtraction Property of EqualityGivenMultiplicative Inverse + Multiplication Property of EqualityGivenSubtraction Property of EqualityDivision Property of EqualityGivenAddition Property of EqualitySubtraction Property of EqualityDivision Property of Equality |

($\frac{x-5}{10}$ = $\frac{x+4}{4}$) 40

4(x – 5) = 10(x + 4)

4x – 20 = 10x + 40

 +20 + 20

4x = 10x + 60

-10x -10x

-6x = 60

x = -10

$\frac{2}{3x}$ + $\frac{1}{4}$ = $\frac{11}{6x}$ - $\frac{1}{3}$

($\frac{2}{3x}$ + $\frac{1}{4}$ = $\frac{11}{6x}$ - $\frac{1}{3}$)12x

(4 • 2) + (3x) = (2 • 11) – (4x)

8 + 3x = 22 – 4x

 +4x +4x

8 + 7x = 22

-8 -8

7x = 14

x = 2