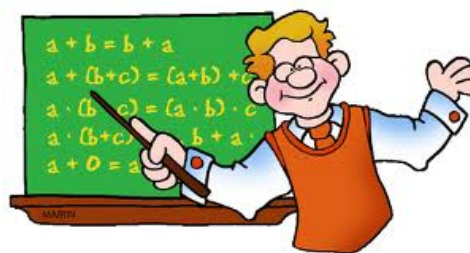
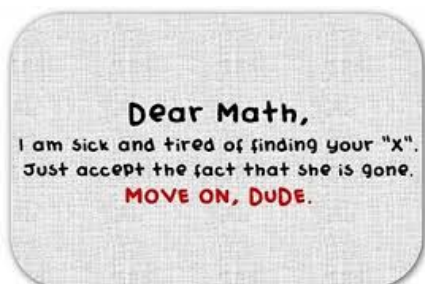


2.5 Reason Using Postulates From Algebra

Goal: Use algebraic properties in logical arguments.



Algebraic Properties of Equality

Let a , b , and c be real numbers.

$$\underline{5} \quad \underline{5} \quad \underline{2}$$

Addition Property

If $a = b$, then $a + c = b + c$.

$$5 + 2 = 5 + 2$$

$$7 = 7$$

Subtraction Property

If $a = b$, then $a - c = b - c$.

$$5 - 2 = 5 - 2$$

$$3 = 3$$

Multiplication Property

If $a = b$, then $ac = bc$.

$$5 \cdot 2 = 5 \cdot 2$$

$$10 = 10$$

Division Property

If $a = b$ and $c \neq 0$, then $\frac{a}{c} = \frac{b}{c}$.

$$\frac{5}{2} = \frac{5}{2}$$

$$2.5 = 2.5$$

Substitution Property

If $a = b$, then a can be substituted for b in any equation or expression.

Solve the equation and write a reason for each step.

EQUATION

$$4x + 9 = -3x + 2$$

$$7x + 9 = 2$$

$$7x = -7$$

$$x = -1$$

REASON

GIVEN

ADDITION P.O.E

SUBTRACTION P.O.E.

DIVISION P.O.E.

Solve the formula $A = \frac{1}{2}bh$ for b.

EQUATION

$$A = \frac{1}{2}bh$$

$$2A = bh$$

$$\frac{2A}{h} = b$$

REASON

GIVEN

MULTIPLICATION P.O.E.

DIVISION P.O.E.

Distributive Property

$a(b + c) = ab + ac$, where a , b , and c are real numbers.

Solve the equation and write a reason for each step.

EQUATION

$$-4(11x + 2) = 80$$

$$-44x - 8 = 80$$

$$-44x = 88$$

$$x = -2$$

REASON

GIVEN

DISTRIBUTIVE POE

ADDITION POE

DIVISION POE

EQUATION

$$14x + 3(7 - x) = -1$$

$$14x + 21 - 3x = -1$$

$$11x + 21 = -1$$

$$11x = -22$$

$$x = -2$$

REASON

GIVEN

DISTRIBUTIVE P.O.E.

COMBINE LIKE TERMS

SUBTRACTION P.O.E.

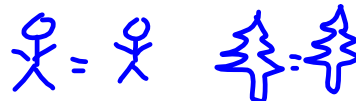
DIVISION P.O.E.

Reflexive Property of Equality

Real Numbers For any real number a , $a = a$.

$$CD = CD$$

$$m\angle A = m\angle A$$



$$5 = 5$$

Segment Length For any segment AB , $AB = AB$.

Angle Measure For any angle A , $m\angle A = m\angle A$.

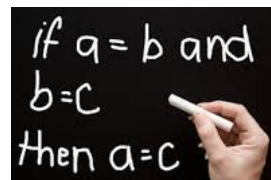
Symmetric Property of Equality

Real Numbers For any real numbers a and b , if $a = b$, then $b = a$.

if $60 = 30 + 30$, then $30 + 30 = 60$ $8x + 3 = y$ then $y = 8x + 3$

Segment Length For any segments AB and CD , if $AB = CD$, then $CD = AB$.

Angle Measure For any angles A and B , if $m\angle A = m\angle B$, then $m\angle B = m\angle A$.

Transitive Property of Equality**Real Numbers**For any real numbers a , b , and c , if $a = b$ and $b = c$, then $a = c$.

$$x = y \text{ and } y = z \text{ then } x = z$$

Segment LengthFor any segments AB , CD , and EF , if $AB = CD$ and $CD = EF$, then $AB = EF$.**Angle Measure**For any angles A , B , and C , if $m\angle A = m\angle B$ and $m\angle B = m\angle C$, then $m\angle A = m\angle C$.**Name the property of equality the statement illustrates.**If $m\angle 6 = m\angle 7$, then $m\angle 7 = m\angle 6$.If $JK = KL$ and $KL = 12$, then $JK = 12$. $m\angle W = m\angle W$

HW: PG 100 #'s 3-19 odds,
21-25, 30-32



"Mr. Osborne, may I be excused? My brain is full."