**2.5 Reasoning Using Properties from Algebra**

**Properties of Equality(p.o.e):**

**Reflexive Property of Equality -**

**a = a**

**AB=AB**

**m<A=m<A**

**Symmetric Property of Equality-**

**If a = b, then b = a.**

**If AB=CD, then CD=AB.**

**If m<A=m<B, then m<B=m<A.**

**Transitive Property of Equality-**

**If a = b and b = c, then a = c.**

**If AB=CD and CD=EF, then AB=EF.**

**If m<A=m<B and m<B=m<C, then m<A=m<C.**

**Addition p.o.e.-**

**If a = b, then a + c = b + c**

**Subtraction p.o.e.-**

**If a=b, then a – c = b – c.**

**Multiplication p.o.e.-**

**If a = b, then a c = b c**

**Division p.o.e.-**

**If a=b, and if c**$\ne 0$**,** $\frac{a}{c}$ **=** $\frac{b}{c}$ **.**

**Substitution p.o.e.-**

**If a = b, then a may be replaced by b in any equation or expression.**

**Distributive Property-**

**a ( b + c ) = ab + ac**

**Algebraic Proof.:**

**Write a two column proof to show that if**

**-3(8x – 4) = 60, then x=-2.**

**Given:**

**Prove:**

**Proof:**

**Ex. 2x+ 3x=50**

 **5x=50 What property???**

**Example of a Geometric Proof**

**Given: EF=GH**

**Prove: EG=FH**