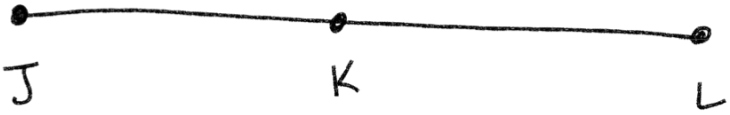
S-G Geometry Session 6/27

Given: $4x + 3 = 27$

Prove: $x = 6$

Statements	Reasons
$4x + 3 = 27$	Given
$-3 \quad -3$	
$4x = 24$	Subtraction Property of Equality (Sub POE)
$\frac{4x}{4} = \frac{24}{4}$	
$x = 6$	Div POE



Given:

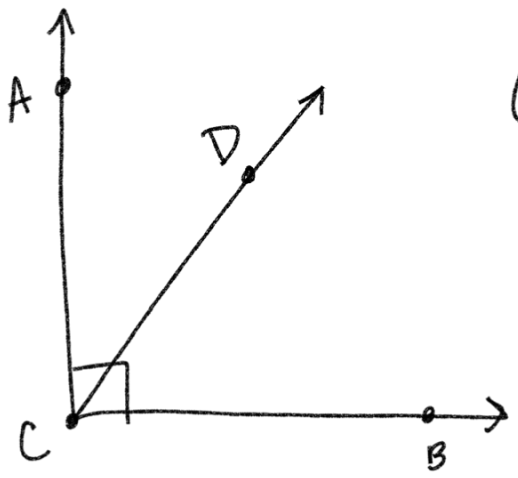
$\overline{JK} = 5x$

$\overline{JL} = 62$

$\overline{KL} = 8x - 3$

Prove: $x = 5$

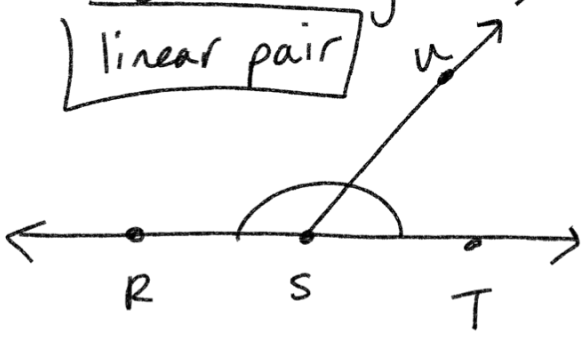
Statement	Reasons
$\overline{JK} = 5x, \overline{JL} = 62, \overline{KL} = 8x-3$	Given
$\overline{JK} + \overline{KL} = \overline{JL}$	Segment Addition Postulate (SAP)
$\downarrow \quad \downarrow \quad \downarrow$	
$5x + 8x - 3 = 62$	Substitution
$13x - 3 = 62$	Simplify
$+3 \quad +3$	
$\frac{13x}{13} = \frac{65}{13}$	Add POE
$x = 5$	Div POE



C → 90°

S → 180°

Because adjacent,
linear pair



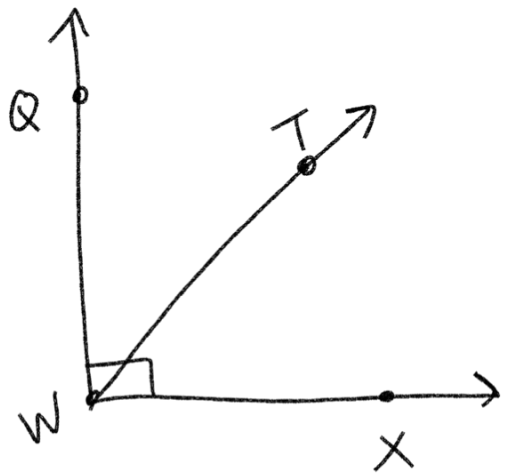
∡ACB = 90°
Right Angle
Perpendicular

∡ACD + ∡DCB = 90°
Angle Addition Postulate
∡ACD & ∡DCB
are complementary angles

∡RST = 180°
straight line

∡RSU + ∡UST = 180°
Angle Addition Postulate

∡RSU & ∡UST are
supplemental angles



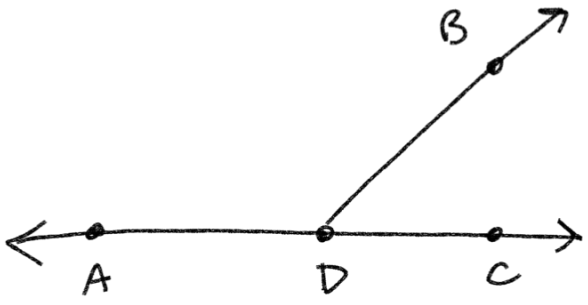
Given: $\measuredangle QWT = 2x$

$\measuredangle TWX = x+6$

$\measuredangle QWX$ is a right angle

Prove: $x = 28$

Statements	Reasons
$\measuredangle QWT = 2x$	Given
$\measuredangle TWX = x+6$	Given
$\measuredangle QWX$ is a right angle	Given
$\measuredangle QWX = 90^\circ$	Definition of Right Angle
$\measuredangle QWT + \measuredangle TWX = \measuredangle QWX$	Angle Addition Postulate (AAP)
$2x + x+6 = 90^\circ$	Substitution
$3x+6 = 90$	Simplify [not Add PoE]
$-6 \quad -6$	
$3x = 84$	Sub PoE
$\frac{3x}{3} = \frac{84}{3}$	Div PoE
$x = 28$	

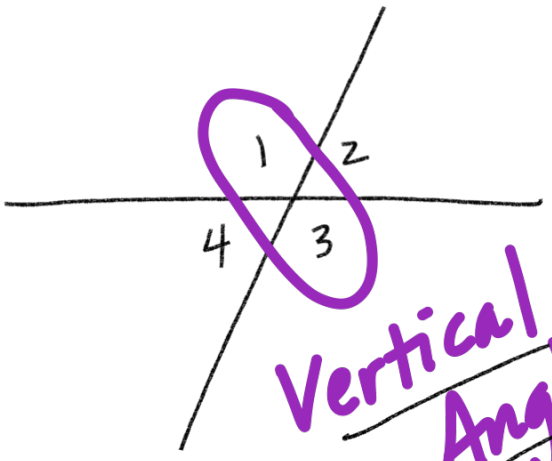


Given $\measuredangle ADB = 3x+6$

$\measuredangle BDC = 2x+4$

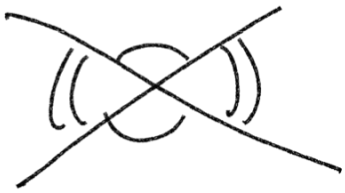
Prove: $x = 34$

Statements	Reasons
$\measuredangle ADB = 3x+6$	Given
$\measuredangle BDC = 2x+4$	
$\measuredangle ADC = 180^\circ$	Definition of a line
$\measuredangle ADB + \measuredangle BDC = \measuredangle ADC$	Angle Addition Postulate
$3x+6 + 2x+4 = 180^\circ$	Substitution
$5x + 10 = 180$	Simplify
$-10 \quad -10$	Sub POE
$\frac{5x}{5} = \frac{170}{5}$	Div POE
$x = 34$	



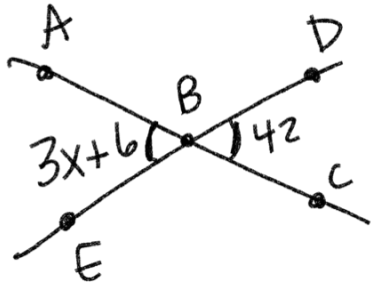
Vertical Angles

[Prove: $\angle 1 \cong \angle 3$]



$\cong \rightarrow =$

Statement	Reasons
$\angle 1 + \angle 2 = 180°$	supplemental or linear pair
$\angle 2 + \angle 3 = 180°$	supplemental or linear pair
$\angle 1 + \angle 2 = \angle 2 + \angle 3$	substitution or syllogism
$-\angle 2 \quad -\angle 2$	
$\angle 1 = \angle 3$	Sub PoE
$\angle 1 \cong \angle 3$	Definition of Congruency



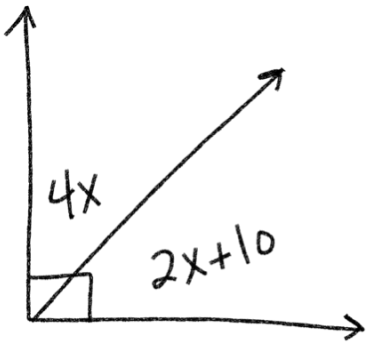
Given: $\angle ABE = 3x+6$

$\angle DBC = 42$

Prove: $x = 12$

Statement	Reasm
$\angle ABE = 3x+6$	Given
$\angle DBC = 42$	
$3x+6 = 42$	Vertical Angles
$-6 \quad -6$	Sub PoE
$\frac{3x}{3} = \frac{36}{3}$	Div PoE
$x = 12$	

1.)



complementary

$4x + 2x + 10 = 90$

$6x + 10 = 90$

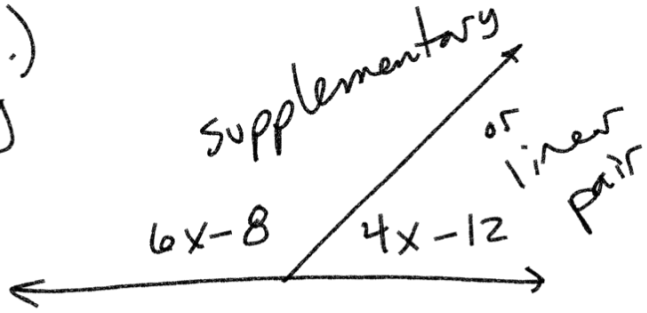
$-10 \quad -10$

$\frac{6x}{6} = \frac{80}{6}$

$x = \frac{40}{3}$

$x = 13.\overline{3}$

2.)



$6x - 8 + 4x - 12 = 180$

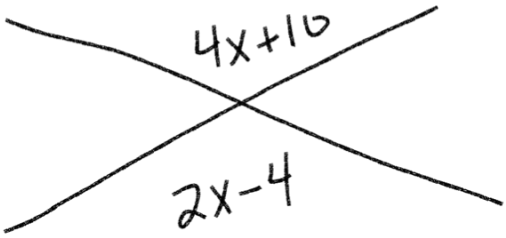
$10x - 20 = 180$

$+20 \quad +20$

$\frac{10x}{10} = \frac{200}{10}$

$x = 20$

3.)



vertical angles

$4x + 10 = 2x - 4$

$-2x \quad -2x$

$2x + 10 = -4$

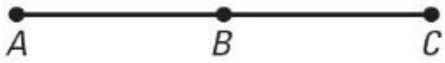
$-10 \quad -10$

$\frac{2x}{2} = \frac{-14}{2}$

$x = -7$

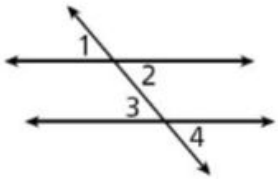
Geometry Proof Supplemental

1.) Given: AC = AB + AB
Prove: AB = BC



Statement	Reason
AB + AB = AC	Given
AB + BC = AC	Angle Additim Postulate
AB + BC = AB + AB	Substitutim or Syllogism
-AB -AB	
BC = AB	Sub POE

2.) Given: ∠1 ≅ ∠4
Prove: ∠2 ≅ ∠3



Statement	Reason
∠1 ≅ ∠2	vertical angles
∠3 ≅ ∠4	vertical angles
∠1 ≅ ∠4	given
∠2 ≅ ∠3	Substitutim or syllogism

∠1 = ∠2

∠3 = ∠4

∠1 = ∠4

∠1

∠3 = ∠2