

Given : $4x + 3 = 27$

Prove : $x = 6$

Statements

$$4x + 3 = 27$$

$$\begin{array}{r} -3 \quad -3 \end{array}$$

$$4x = 24$$

$$\begin{array}{r} \overline{4} \quad \overline{4} \end{array}$$

$$x = 6$$

Reasons

Given

Subtract Pof

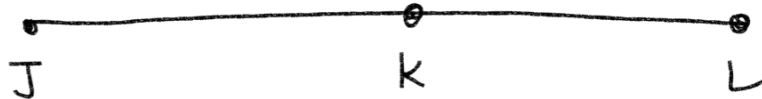
Division Pof

Given: $\overline{JK} = 5x$

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

$\overline{JL} = 62$

Prove: $x = 5$



Statement

$$\overline{JK} = 5x$$

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

$$\overline{JL} = 62$$

$$\overline{JK} + \overline{KL} = \overline{JL}$$

$$\begin{array}{ccc} \downarrow & \downarrow & \downarrow \end{array}$$

$$5x + 8x - 3 = 62$$

$$13x - 3 = 62$$

$$\begin{array}{r} +3 \quad +3 \end{array}$$

$$13x = 65$$

$$x = 5$$

Reason

Given.

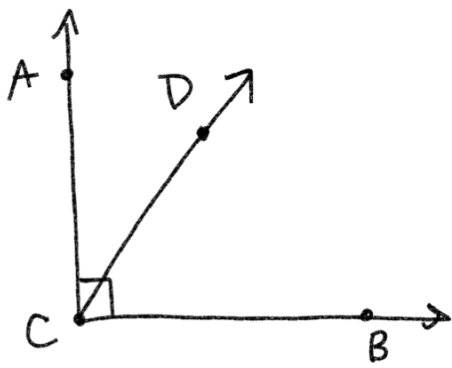
Segment Addition Postulate (SAP)

Substitution

Simplify

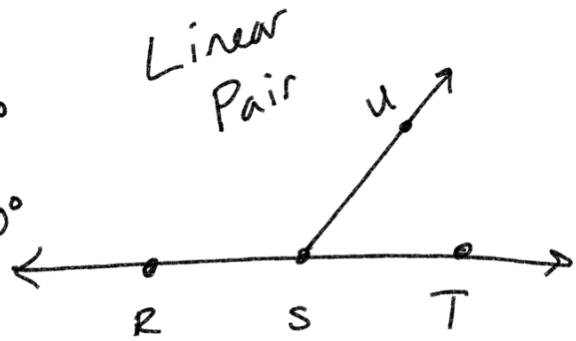
Addition Pof

Division Pof



$$C \rightarrow 90^\circ$$

$$S \rightarrow 180^\circ$$



$$\angle ACB = 90^\circ$$

Right Angle
Perpendicular

$$\angle ACD + \angle DCB = 90^\circ$$

Angle Addition Postulate

$\angle ACD$ and $\angle DCB$
are complementary angles

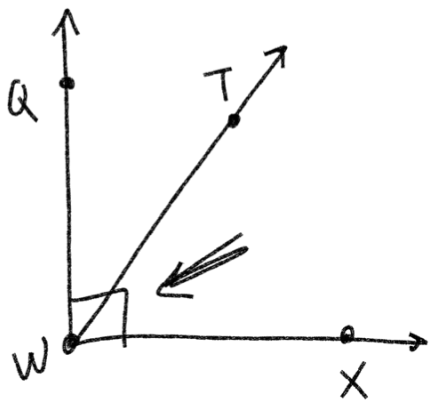
$$\angle RST = 180^\circ$$

straight line

$$\angle RSU + \angle UST = 180^\circ$$

Angle Addition Postulate

$\angle RSU$ and $\angle UST$ are
supplemental angles



Given: $\angle QWT = 2x$

$\angle TWX = x + 6$

Prove: $x = 28$

Statement

Reason

$$\angle QWT = 2x$$

Given

$$\angle TWX = x + 6$$

Given/

$$\angle QWX = 90^\circ$$

Definition of right
angle

$$\angle QWT + \angle TWX = \angle QWX$$

Angle Add Postulate

$$\downarrow$$

$$2x + x + 6 = 90^\circ$$

substitution

$$3x + 6 = 90$$

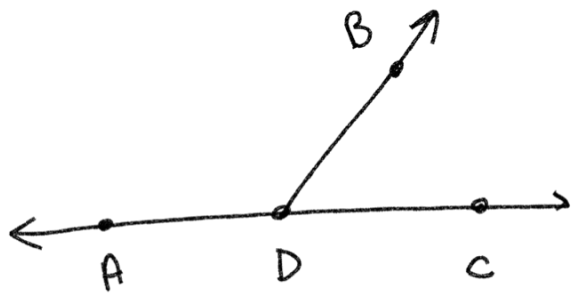
simplify

$$\begin{array}{r} 3x + 6 = 90 \\ -6 \quad -6 \\ \hline 3x = 84 \end{array}$$

subtraction P.o.E

$$x = 28$$

Division P.o.E



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

$\angle BDC = 2x + 4$

Prove: $x = 34$

Statement

$\angle ADB = 3x + 6$

$\angle BDC = 2x + 4$

$\angle ADC = 180^\circ$

$\angle ADB + \angle BDC = \angle ADC$

$\angle ADB + \angle BDC = 180^\circ$

$3x + 6 + 2x + 4 = 180^\circ$

$5x + 10 = 180^\circ$

$5x = 170$

$x = 34$

Reason

Given

a Σ Given/Definition of straight line

a Σ angle addition postulate

b Σ supplementary angles

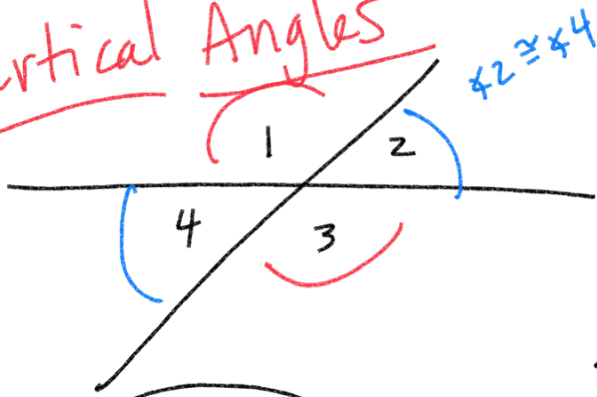
substitution

simplify

Sub P of

Div P of

Vertical Angles



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

\cong congruent
same as equal

statement

$$\angle 1 + \angle 2 = 180^\circ$$

$$\angle 2 + \angle 3 = 180^\circ$$

$$\angle 1 + \angle 2 = \angle 2 + \angle 3$$

$$-\angle 2 \quad -\angle 2$$

$$\angle 1 = \angle 3$$

$$\angle 1 \cong \angle 3$$

Reason

linear pair

linear pair

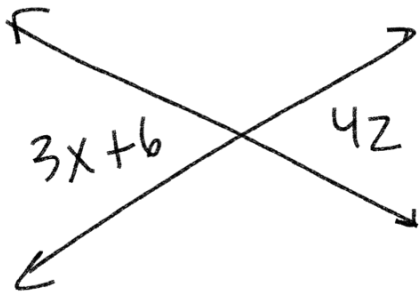
substitution

Syllogism/

Transitive

Subtraction PoE

Definition of
congruency



Prove $x=12$

statement

$$3x+6 = 42$$

$$-6 \quad -6$$

$$\frac{3x}{3} = \frac{36}{3}$$

$$x = 12$$

Reason

Vertical
Angles

Subtraction PoE

Division PoE

HW

Complementary

Supplemental

Vertical angles

SAP/AAP