$\sim Q \to \sim P$ Solutions

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CO-C9a Practice Assessment

1. Write the converse ($Q \to P$) and the contrapositive ($\sim Q \to \sim P$) of the following statement:
   If $\underbrace{\text{a shape is a square}}_{P}$, then $\underbrace{\text{it has 4 right angles}}_{Q}$.

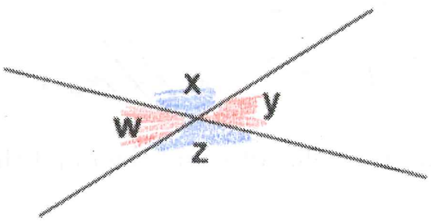
Converse: $Q \to P$ If it has 4 right angles, then it is a square.

(this is false, btw...)

Contrapositive: $\sim Q \to \sim P$ If it doesn't have 4 right angles, then it is not a square.

(true, btw...)

2. Write a convincing argument as to why $\angle w \cong \angle y$.



(possible answer)

Since they form a linear pair, $\angle w + \angle x = 180°$. Likewise, $\angle x + \angle y = 180°$.

By Substitution,

$$\angle w + \angle x = \angle x + \angle y$$

Subtracting,

$$\angle w + \cancel{\angle x} = \cancel{\angle x} + \angle y$$
$$-\cancel{\angle x} \quad -\cancel{\angle x}$$

$$\angle w = \angle y$$

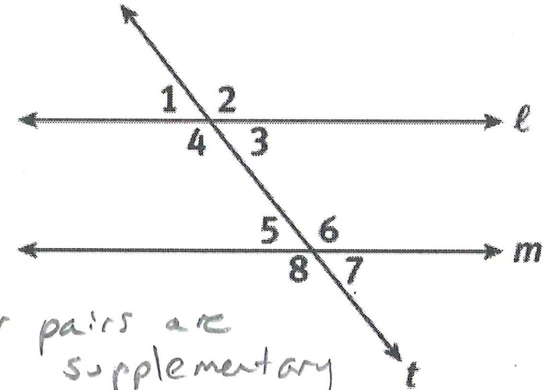
Q.E.D.

CO-C9b

1. Lines m and l are parallel. If $\angle 5 = 40°$, find the measures of the following angles:

   1: $40°$ 3: $40°$ 6: $140°$ 8: $140°$

   2: $140°$ 4: $140°$ 7: $40°$



key ideas → vertical angles $\cong$

→ Corresponding angles $\cong$ → linear pairs are supplementary

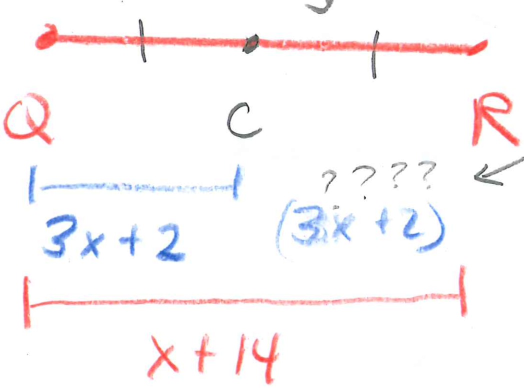
2. Suppose we don't know if l and m are parallel, but we think we can prove it. If we are given that $\angle 4 \cong \angle 6$, show that we can prove $m \parallel l$

Given that $\angle 4 \cong \angle 6$, we can show that $\angle 6 \cong \angle 8$ because they are vertical angles. So by substitution/transitive property, $\angle 4 \cong \angle 6 \cong \angle 8$, or $\angle 4 \cong \angle 8$. These are corresponding and congruent, so $\ell \parallel m$. QED.

CO-D12a

3. Point C is the midpoint of $\overline{QR}$. QC = 3x+2 and QR = x+14. Find the value of x and then find the length of $\overline{CR}$.

$\cong$



Note: Since C is the midpoint, $\overline{QC} \cong \overline{CR}$. So $CR = 3x+2$ also!!!

Segment Addition Postulate:

$$\overbrace{3x+2}^{QC} + \overbrace{3x+2}^{CR} = \overbrace{x+14}^{QR}$$

$$6x + 4 = \cancel{x} + 14$$
$$-x \qquad -x$$
$$5x + \cancel{4} = 14$$
$$-4 \qquad -4$$
$$\cancel{5}x = 10 \Rightarrow x = 2$$

$QC = CR = 3x+2$

$3(2)+2$

$6+2$

8

CR