

CYU 2.4 Algebraic Reasoning

Use when you get it right all by yourself
S Use when you did it all by yourself, but made a silly mistake
H Use when you could do it alone with a little help from teacher or peer
G Use when you completed the problem in a group
X Use when a question was attempted but wrong (get help)
N Use when a question was not even attempted

CONCEPTS	BASIC	INTERMEDIATE	ADVANCED
Addition POE	1	2, 3	6 - 8
Subtraction POE	1	2, 3	6 - 8
Multiplication POE		2, 3	6 - 8
Division POE	1	2, 3	6 - 8
Substitution POE	1	2, 3	6 - 8
Distributive Property	1	2, 3	6 - 8
Reflexive Property	5	2, 3	6 - 8
Symmetric Property	5	2, 3	6 - 8
Transitive Property	5	2, 3	6 - 8

1. Write the property that justifies each step.

$3x - 12 = 7x + 8$
 $-4x - 12 = 8$
 $-4x = 20$
 $x = -5$

Subtraction POE
Addition POE
Division POE

2. Solve the equation (similar to #1 and justify each step like #1).

a) $44 - 2(3x + 4) = -18x$ Given b) $4(5x - 9) = -2(x + 7)$ Given

$44 - 6x - 8 = -18x$
 $36 - 6x = -18x$
 $36 = -12x$
 $-3 = x$

Distributive Property
 CLT or Simplify
 Add. POE
 Division POE

1) $20x - 36 = -2x - 14$
 2) $22x = 22$
 3) $x = 1$

1.) Distributive Property
 2.) Add. POE
 3.) Division POE

3. Solve the equation for y. Justify each step with a property.

a) $\frac{1}{2}x - \frac{3}{4}y = -2$ *Given*

b) $12 - 3y = 30x + 6$ *Given*

2) $2x - 3y = -8$

3) Mult. POE

2) $4 - y = 10x + 2$

Given

2) Division POE

3) $-3y = -2x - 8$

3) Subtraction POE

3) $-y = 10x - 2$

3) Subtraction POE

4) $y = \frac{2}{3}x + \frac{8}{3}$

4) Division POE

4) $y = -10x + 2$

4) Division POE

4. Solve the equation for "h" and justify each step. $S = 2\pi r^2 + 2\pi rh$

Given

2) $S - 2\pi r^2 = 2\pi rh$

2) Subtraction POE

3) $\frac{S - 2\pi r^2}{2\pi} = h$

3) Division POE

5. Name the property of equality that the statement illustrates.

a. $m\angle Z = m\angle Z$

Reflexive POE

b. If $x = y$, then $y = x$.

Symmetric POE

c. If $BC = XY$ and $XY = 8$, then $BC = 8$.

Transitive POE

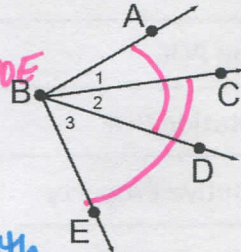
6. In the diagram, $m\angle ABD = m\angle CBE$. Show that $m\angle 1 = m\angle 3$.

1. $m\angle ABD = m\angle CBE$, given

4) $m\angle 1 = m\angle 3$; Subtraction POE

2. $m\angle ABD = m\angle 1 + m\angle 2$
 $m\angle CBE = m\angle 2 + m\angle 3$ Add Post.

3. $m\angle 1 + m\angle 2 = m\angle 2 + m\angle 3$; Substitution POE



7. In the diagram. $AC = BD$. Show that $AB = CD$.



Same as 6 but with Seg. Add. Post. BC is the shared segment.

8. In the figure, $\overline{ZY} \cong \overline{XW}$, $ZX = 5x + 17$, $YW = 10 - 2x$, and $YX = 3$. Find ZY and XW .

1. $\overline{ZY} \cong \overline{XW}$
 $ZX = 5x + 17$
 $YW = 10 - 2x$
 $YX = 3$

1. given

$5x + 17 - 3 = 10 - 2x - 3$

$5x + 14 = 7 - 2x$

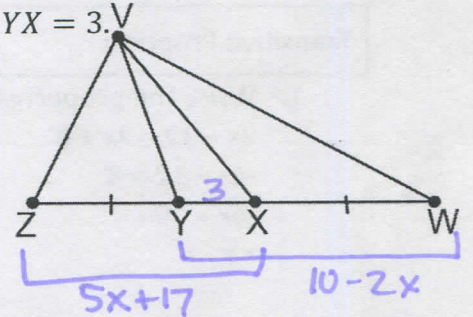
$7x = -7$

$x = -1$

$ZY = 5(-1) + 14 = -5 + 14 = 9$

$XW = 7 - 2(-1) = 7 + 2 = 9$

$ZY = XW = 9$



CYU Reflection: How far can you go: basic, intermediate, or advanced?

Rate your mastery level!

How confident are you with the skills this CYU covered? Circle the score you would give yourself.

●	●	●	●	●	●	●	●
1	2	3	4	5	6	7	8
Basic		Intermediate			Advanced		Solved ALL!

