

10/1/19 - Warm Up Problem

Given: $2(x - 4) + 3x = 6x$

Prove: $x = -8$

Statements	Justifications
1. $2(x - 4) + 3x = 6x$	given
2. $2x - 8 + 3x = 6x$	distributive P
3. $5x - 8 = 6x$	simplify
4. $-8 = x$	subtr PROP
5. $x = -8$	Symmetric of =

Section 2.5 - Reasoning in Algebra

Goal: Complete algebra proofs using substitution and transitive properties

The Substitution Property and the Transitive Properties are used to combine two statements or equations together to form a new statement or equation.

GIVEN	NEW EQUATION
$x + y = z$ $z = 3y$	$x + y = 3y$ Substitution Prop.
$m\angle 1 + m\angle 2 = 90$ $m\angle 1 = 40$	$40 + m\angle 2 = 90$ Substitution Prop.
$2a + b = c$ $4a - 2b = c$	$2a + b = 4a - 2b$ Transitive Prop of =
$m\angle 1 + m\angle 2 = 180$ $m\angle 1 + m\angle 3 = 180$	$m\angle 1 + m\angle 2 = m\angle 1 + m\angle 3$ Transitive Prop. of =

Proofs using Substitution and Transitive Property

Given: $x = 2y + 7$

$x = 4y - 13$

Prove: $y = 10$

Statements	Justifications
1. $x = 2y + 7$	given
2. $x = 4y - 13$	given
3. $2y + 7 = 4y - 13$	Transitive Prop. of =
4. $7 = 2y - 13$	Subtraction Prop
5. $20 = 2y$	Addition Prop.
6. $10 = y$	Division Prop.
7. $y = 10$	Symmetric Prop. of =

Given: $3w + s = t$

$2w = s$

$t = 10r$

Prove: $w = 2r$

Statements	Justifications
1. $3w + s = t$	given
2. $2w = s$	given
3. $t = 10r$	given
4. $3w + 2w = t$	Substitution Prop.
5. $5w = t$	simplify
6. $5w = 10r$	Substitution Prop.
7. $w = 2r$	Division Prop.

Assignment:

Concept 6 WS #2 (1-4)

- whole assignment due by Tuesday 10/8

• Fill in the missing justifications in each proof.

1. Given: $a = 2b + 6$
 $a = 9b - 8$

Prove: $b = 2$

Statement	Justification
1. $a = 2b + 6$	given
2. $a = 9b - 8$	given
3. $2b + 6 = 9b - 8$ $-2b - 2b$	Transitive Prop. of =
4. $6 = 7b - 8$	Subtraction Prop.
5. $14 = 7b$	Addition Prop.
6. $2 = b$	Division Prop.
7. $b = 2$	Symmetric Prop. of =

2. Given: $3b + d = f$
 $d = 2b$
 $f = g$

Prove: $g = 5b$

Statement	Justification
1. $3b + d = f$	
2. $d = 2b$	
3. $f = g$	
4. $3b + 2b = f$	
5. $5b = f$	
6. $5b = g$	
7. $g = 5b$	

3. Given: $m = n + 5$
 $2m = n$

Prove: $m = -5$

Statement	Justification
1. $m = n + 5$	
2. $2m = n$	
3. $m = 2m + 5$	
4. $-1m = 5$	
5. $m = -5$	

4. Given: $g = 2h$
 $g + h = k$
 $k = m$

Prove: $m = 3h$

Statement	Justification
1. $g = 2h$	
2. $g + h = k$	
3. $k = m$	
4. $2h + h = k$	
5. $3h = k$	
6. $3h = m$	
7. $m = 3h$	