

Day 06 Homework

2-6 Algebraic Proof

Name Master E
 Date _____ Block _____

1-16: State the property of equality that justifies each statement.

<p>1. If $80 = y$, then $y = 80$.</p> <p>Symmetric POE</p>	<p>2. If $\frac{1}{3}x = 25$, then $x = 75$.</p> <p>Multiplication POE (Mult. by 3)</p>
<p>3. If $m = p$ and $p = r$, then $m = r$.</p> <p>Transitive POE</p>	<p>4. If $x + y = 90$ and $y = 40$, then $x + 40 = 90$.</p> <p>Substitution POE</p>
<p>5. If $7x = 28$, then $x = 4$.</p> <p>Division POE (\div by 7)</p>	<p>6. If $x + y = 180$ and $180 = t$, then $x + y = t$.</p> <p>Transitive POE</p>
<p>7. If $2x + 27 = 57$, then $2x = 30$.</p> <p>Subtraction POE (-27)</p>	<p>8. If $x = y$, then $\frac{1}{4}x = \frac{1}{4}y$.</p> <p>Multiplication POE (\cdot by $\frac{1}{4}$)</p>
<p>9. If $y = 30$ and $y = x$, then $x = 30$.</p> <p>Substitution POE</p>	<p>10. If $2x + 2y = 180$, then $x + y = 90$.</p> <p>Division POE (\div by 2)</p>
<p>11. $x - 12 = x - 12$</p> <p>Reflexive POE</p>	<p>12. If $3x = 12$ and $12 = 4y$, then $3x = 4y$.</p> <p>Transitive POE</p>
<p>13. If $12x - 10 = 15$, then $12x = 25$.</p> <p>Addition POE ($+10$)</p>	<p>14. If $15 = x$, then $x = 15$.</p> <p>Symmetric POE</p>
<p>15. If $10(x - 15) = 200$, then $10x - 150 = 200$.</p> <p>Distributive POE</p>	<p>16. If $12x - 10 = 15x + 12$, then $-10 = 3x + 12$.</p> <p>Subtraction POE ($-12x$)</p>

17-20: Complete the following algebraic proofs with the correct statement or reason.

17. Given: $8x - 5 = 2x + 1$
 Prove: $x = 1$

Statements	Reasons
a. $8x - 5 = 2x + 1$	a. Given
b. $8x - 5 - 2x = 2x + 1 - 2x$	b. Subtraction POE
c. $6x - 5 = 1$	c. Simplify b
d. $6x - 5 + 5 = 1 + 5$	d. Addition POE
e. $6x = 6$	e. Simplify d
f. $\frac{6x}{6} = \frac{6}{6}$	f. Division POE
g. $x = 1$	g. Simplify f

18. Given: $\frac{4x + 6}{2} = 9$
 Prove: $x = 3$

Statements	Reasons
a. $\frac{4x + 6}{2} = 9$	a. Given
b. $2 \cdot \left(\frac{4x + 6}{2}\right) = 2 \cdot 9$	b. Multiplication POE
c. $4x + 6 = 18$	c. Simplify b
d. $4x + 6 - 6 = 18 - 6$	d. Subtraction POE
e. $4x = 12$	e. Simplify d
f. $\frac{4x}{4} = \frac{12}{4}$	f. Division POE
g. $x = 3$	g. Simplify f

19. Given: $4x + 8 = x + 2$
 Prove: $x = -2$

Statements	Reasons
a. $4x + 8 = x + 2$	a. Given
b. $4x + 8 - x = x + 2 - x$	b. Subtraction POE
c. $3x + 8 = 2$	c. Simplify b
d. $3x + 8 - 8 = 2 - 8$	d. Subtraction POE
e. $3x = -6$	e. Simplify d
f. $\frac{3x}{3} = \frac{-6}{3}$	f. Division POE
g. $x = -2$	g. Simplify f

20. Now you do your own proof ☺:

Given: $-2(x + 5) - 4 = 20$
 Prove: $x = \underline{\hspace{2cm}}$

a. $-2(x+5) - 4 = 20$ a. Given
 b. $-2x + 10 - 4 = 20$ b. Distributive POE
 c. $-2x - 14 = 20$ c. Simplify b
 d. $-2x - 14 + 14 = 20 + 14$ d. Addition POE
 e. $-2x = 34$ e. Simplify d
 f. $\frac{-2x}{-2} = \frac{34}{-2}$ f. Division POE
 g. $x = -17$ g. Simplify f