Name: _____ **Class:** _____ **Date:** _____ **ID: A**

Two-Column Proofs

Multiple Choice
Identify the choice that best completes the statement or answers the question.

Complete the proof by giving the reason for the indicated step.
If $\frac{2}{3}x = 8 - 2x$, then $x = 3$.

Given: $\frac{2}{3}x = 8 - 2x$ Prove: $x = 3$

____ 1. $\Rightarrow$ a. $\frac{2}{3}x = 8 - 2x$
b. $2x = 3(8 - 2x)$
c. $2x = 24 - 6x$
d. $8x = 24$
e. $x = 3$

a. Reflexive property of equality
b. Multiplication property of equality
c. Given
d. Substitution property of equality

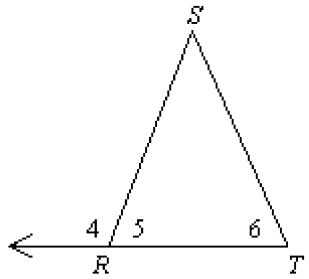
____ 2. a. $\frac{2}{3}x = 8 - 2x$
b. $2x = 3(8 - 2x)$
$\Rightarrow$ c. $2x = 24 - 6x$
d. $8x = 24$
e. $x = 3$

a. Distributive property
b. Multiplication property of equality
c. Associative property of equality
d. Commutative property of equality

____ 3. a. $\frac{2}{3}x = 8 - 2x$
b. $2x = 3(8 - 2x)$
c. $2x = 24 - 6x$
d. $8x = 24$
$\Rightarrow$ e. $x = 3$

a. Division property of equality
b. Symmetric property of equality
c. Addition property of equality
d. Multiplication property of equality

Copy and complete the proof. Give the reason for the indicated step.



If $m\angle 4 + m\angle 6 = 180°$, then $m\angle 5 = m\angle 6$.
Given: $m\angle 4 + m\angle 6 = 180°$ Prove: $m\angle 5 = m\angle 6$

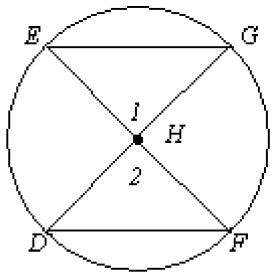
____ 4. a. $m\angle 4 + m\angle 6 = 180°$
⇒ b. $m\angle 4 + m\angle 5 = 180°$
c. $m\angle 4 + m\angle 5 = m\angle 4 + m\angle 6$
d. $m\angle 4 = m\angle 4$
e. ___?___ = ___?___

a. Substitution property of equality
b. Linear pairs of angles are supplementary.
c. Given
d. Angle addition

____ 5. a. $m\angle 4 + m\angle 6 = 180°$
b. $m\angle 4 + m\angle 5 = 180°$
c. $m\angle 4 + m\angle 5 = m\angle 4 + m\angle 6$
⇒ d. $m\angle 4 = m\angle 4$
e. ___?___ = ___?___

a. Symmetric property of equality
b. Addition property of equality
c. Subtraction property of equality
d. Reflexive property of equality

Write a two-column proof. Give a reason for the indicated step.
Given: Circle H; arc $EG \cong$ arc DF
Prove: $\overline{EG} \cong \overline{DF}$



____ 6. Proof:
⇒ a. arc $EG \cong$ arc DF
b. $\overline{HE} \cong \overline{HD}$ and $\overline{HG} \cong \overline{HF}$
c. $\angle 1 \cong \angle 2$
d. $\Delta EHG \cong \Delta DHF$
e. $\overline{EG} \cong \overline{DF}$
a. Minor arcs are congruent.
b. Given
c. All radii in a circle are congruent.
d. Central angles are congruent.

____ 7. Proof:
a. arc $EG \cong$ arc DF
b. $\overline{HE} \cong \overline{HD}$ and $\overline{HG} \cong \overline{HF}$
⇒ c. $\angle 1 \cong \angle 2$
d. $\Delta EHG \cong \Delta DHF$
e. $\overline{EG} \cong \overline{DF}$
a. Minor arcs are congruent.
b. Congruent arcs have congruent chords.
c. Linear pairs of angles are congruent.
d. Corresponding central angles to congruent arcs are congruent.

____ 8. Proof:
a. arc $EG \cong$ arc DF
b. $\overline{HE} \cong \overline{HD}$ and $\overline{HG} \cong \overline{HF}$
c. $\angle 1 \cong \angle 2$
d. $\Delta EHG \cong \Delta DHF$
⇒ e. $\overline{EG} \cong \overline{DF}$
a. Corresponding parts of congruent triangles are congruent (CPCTC).
b. All radii for a circle are congruent.
c. Chords equally distant from the diameter are congruent.
d. Chords are congruent in a circle.

Two-Column Proofs
Answer Section

MULTIPLE CHOICE

1. C
2. A
3. A
4. B
5. D
6. B
7. D
8. A