

“Reasons in Algebra” Handout

G.CO

Fill in the reason that justifies each step.

1. Solve for x .

$$m\angle CDE + m\angle EDF = 180$$

$$x + (3x + 20) = 180$$

$$4x + 20 = 180$$

$$4x = 160$$

$$x = 40$$

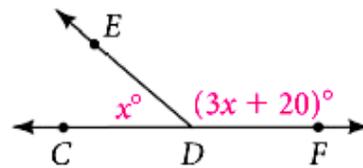
a. ?

b. ?

c. ?

d. ?

e. ?



2. Solve for n .

Given: $XY = 42$

$$XZ + ZY = XY \quad \text{a. } \underline{?}$$

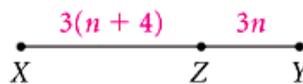
$$3(n + 4) + 3n = 42 \quad \text{b. } \underline{?}$$

$$3n + 12 + 3n = 42 \quad \text{c. } \underline{?}$$

$$6n + 12 = 42 \quad \text{d. } \underline{?}$$

$$6n = 30 \quad \text{e. } \underline{?}$$

$$n = 5 \quad \text{f. } \underline{?}$$



Give a reason for each step.

3. $\frac{1}{2}x - 5 = 10$ Given

$$2\left(\frac{1}{2}x - 5\right) = 20 \quad \text{a. } \underline{?}$$

$$x - 10 = 20 \quad \text{b. } \underline{?}$$

$$x = 30 \quad \text{c. } \underline{?}$$

4. $5(x + 3) = -4$ Given

$$5x + 15 = -4 \quad \text{a. } \underline{?}$$

$$5x = -19 \quad \text{b. } \underline{?}$$

$$x = -\frac{19}{5} \quad \text{c. } \underline{?}$$

Name the property that justifies each statement.

5. $\angle Z \cong \angle Z$

7. If $12x = 84$, then $x = 7$.

9. If $m\angle A = 15$, then $3m\angle A = 45$.

11. If $3x + 14 = 80$, then $3x = 66$.

13. If $2x + y = 5$ and $x = y$,
then $2x + x = 5$.

15. If $\angle 1 \cong \angle 2$ and $\angle 2 \cong \angle 3$, then $\angle 1 \cong \angle 3$.

6. $2(3x + 5) = 6x + 10$

8. If $\overline{ST} \cong \overline{QR}$, then $\overline{QR} \cong \overline{ST}$.

10. $XY = XY$

12. If $KL = MN$, then $MN = KL$.

14. If $AB - BC = 12$,
then $AB = 12 + BC$.