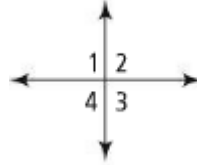


Spend a few minutes looking over the **Unit 6: Reasons for proofs** sheet. Always start your proofs with the given information and build from there.

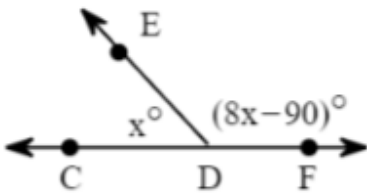
1. Fill in the blanks on the following proof.
 Given: $\angle 1 \cong \angle 2$
 Prove: $\angle 4 \cong \angle 3$



#1 Choices for blanks
 Given
 Vertical angles are congruent
 Transitive Property of Congruence
 $\angle 1 \cong \angle 4$

Statements:	Reasons:
1) $\angle 1 \cong \angle 2$	a) <u>Given</u>
2) $\angle 4 \cong \angle 2$	b) Vertical angles are \cong
3) <u>$\angle 1 \cong \angle 4$</u>	c) Transitive Property of Congruence
4) $\angle 1 \cong \angle 3$	d) <u>vertical angles are \cong</u>
5) $\angle 4 \cong \angle 3$	e) <u>Transitive P. of Congruence</u>

2. Given the angles below:



#2 Choices for blanks:
 Definition of Supplementary,
 Division Property
 Distributive Property,
 Addition Property of Equality,
 Substitution Property,
 Transitive Property,
 Subtraction Property of Equality,
 Division Property,
 Reflexive Property

Fill in the reason that justifies each step.

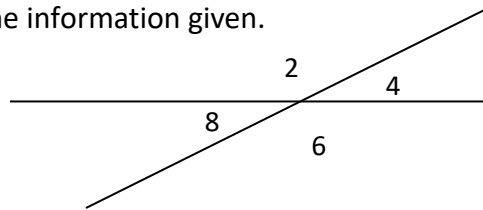
$\angle CDE$ and $\angle EDF$ are supplementary.
 $m\angle CDE + m\angle EDF = 180$
 $x + (8x - 90) = 180$
 $9x - 90 = 180$
 $9x = 270$
 $x = 30$

- \triangle that form a linear pair are supplementary.
 a. definition of Suppl.
 b. substitution P.
 c. substitution / distributive
 d. addition P.
 e. division P.

3. Write a complete proof using the information given.

Given: $\angle 2 \cong 140^\circ$

Prove: $\angle 8 \cong 40^\circ$



#3 Choices for blanks

Definition of linear pair

$\angle 2 + \angle 8 = 180^\circ$

Substitution property of equality

Given

$\angle 8 = 40^\circ$

Statements:

Reasons:

- 1) $\angle 2 \cong 140^\circ$
- 2) $\angle 2$ and $\angle 8$ are supplementary
- 3) $\angle 2 + \angle 8 = 180^\circ$
- 4) $140^\circ + \angle 8 = 180^\circ$
- 5) $\angle 8 = 40^\circ$

- a) Given
- b) definition of a linear pair
- c) Definition of supplementary
- d) Substitution
- e) Subtraction Property

4. Complete the proof by filling in the spaces below.

#4 Choices for blanks

Segment Addition Postulate

$JK = 48$

Division property of equality

Subtraction property of equality

$4x + (x + 3) = 48$

$5x = 45$

Given: $JK = 48$

Prove: $x = 9$



Statements

Reasons

- 1) $JK = 48$
- 2) $JL + LK = JK$
- 3) $4x + x + 3 = 48$
- 4) $5x + 3 = 48$
- 5) $5x = 45$
- 6) $x = 9$

- a) Given
- b) Segment addition postulate
- c) Substitution Property
- d) Distributive Property
- e) subtraction
- f) division prop.

5. Use the statements and reasons given at the bottom to write a complete proof of the following:

Given: C is the midpoint of \overline{AD} .

Prove: $x = 4$

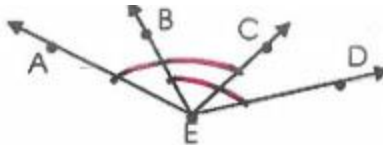


Statements:

Reasons:

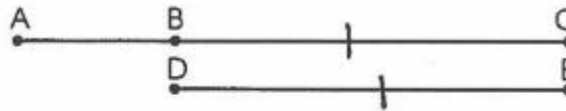
1) C is the midpoint of \overline{AD}	a) Given
2) $\overline{AC} \cong \overline{CD}$	b) definition of midpoint
3) $m\overline{AC} = m\overline{CD}$	c) congruent segments have = lengths
4) $5x = 3x + 8$	d) Substitution Property
5) $2x = 8$	e) Subtraction Property
6) $x = 4$	f) Division Property of Equality
Statement choices: $5x = 3x + 8$ $x = 4$ C is the midpoint of \overline{AD}	Reason choices: Congruent segments have equal length Subtraction Property of Equality Definition of midpoint

6. Given: $\angle AEC \cong \angle DEB$
Prove: $\angle AEB \cong \angle DEC$



Statements	Reasons
1. $\angle AEC \cong \angle DEB$	1. Given
2. $m\angle AEC = m\angle DEB$	2. Definition of Congruent Angles
3. $m\angle AEB + m\angle BEC = m\angle AEC$	3. Angle Addition Postulate
4. $m\angle DEC + m\angle BEC = m\angle DEB$	4. Angle Addition Postulate
5. $m\angle AEB + m\angle BEC = m\angle DEC + m\angle BEC$	5. Substitution Prop. \cong
6. $m\angle AEB = m\angle DEC$	6. Subtraction Prop. \cong
7. $\angle AEB \cong \angle DEC$	7. Definition of Congruent Angles

7. Given: $\overline{BC} \cong \overline{DE}$
Prove: $AC = AB + DE$



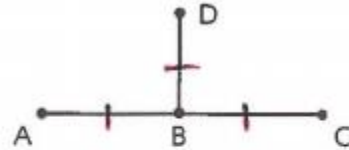
Statements	Reasons
1. $\overline{BC} \cong \overline{DE}$	1. Given
2. $BC = DE$	2. Definition of Congruent Segments
3. $AC = AB + BC$	3. Segment Addition Postulate
4. $AC = AB + DE$	4. Substitution Prop. \cong

8. Given: B is between A and D ; C is between A and D
 Prove: $AB + BD = AC + CD$



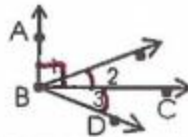
Statements	Reasons
1. B is between A and D ; C is between A and D	1. Given
2. $AB + BD = AD$	2. Segment Addition Postulate
3. $AC + CD = AD$	3. Segment Addition Postulate
4. $AD = AC + CD$	4. Symmetric Prop. \cong
5. $AB + BD = AC + CD$	5. Substitution Prop. \cong

9. Given: $A, B,$ and C are collinear; $AB = BD$; $BD = BC$
 Prove: B is the midpoint of \overline{AC}



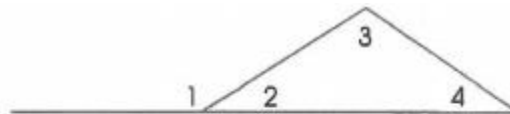
Statements	Reasons
1. A, B, C collinear, $AB = BD$, $BD = BC$	1. Given
2. $AB = BC$	2. Transitive Property of Equality
3. $\overline{AB} \cong \overline{BC}$	3. Definition of Congruent Segments
4. B is the midpoint of \overline{AC}	4. Definition of Midpoint

10. Given: $\overline{AB} \perp \overline{BC}$; $m\angle 2 = m\angle 3$
 Prove: $m\angle 1 + m\angle 3 = 90^\circ$



Statements	Reasons
1. $\overline{AB} \perp \overline{BC}$; $m\angle 2 = m\angle 3$	1. Given
2. $\angle ABC$ is a right angle	2. Definition of Perpendicular
3. $m\angle ABC = 90^\circ$	3. Definition of Right Angle
4. $m\angle ABC = m\angle 1 + m\angle 2$	4. Angle Addition Postulate
5. $m\angle 1 + m\angle 2 = 90^\circ$	5. Substitution Prop. \cong (or transitive)
6. $m\angle 1 + m\angle 3 = 90^\circ$	6. Substitution Prop. \cong

11. Given: $\angle 1$ and $\angle 2$ form a linear pair;
 $m\angle 2 + m\angle 3 + m\angle 4 = 180^\circ$
 Prove: $m\angle 1 = m\angle 3 + m\angle 4$



Statements	Reasons
1. $\angle 1$ and $\angle 2$ form a linear pair	1. Given
2. $\angle 1$ and $\angle 2$ are supplementary	2. Definition of Linear Pair
3. $m\angle 2 + m\angle 3 + m\angle 4 = 180^\circ$	3. Given
4. $m\angle 1 + m\angle 2 = 180^\circ$	4. Definition of Supplementary Angles
5. $m\angle 2 = m\angle 2$	5. Reflexive Prop. \cong
6. $m\angle 1 + m\angle 2 = m\angle 2 + m\angle 3 + m\angle 4$	6. Substitution Prop. \cong
7. $m\angle 1 = m\angle 3 + m\angle 4$	7. Subtraction Prop. \cong