Proof Structure

Statements, reasons, diagram discipline, and core geometric justification.

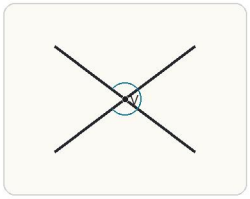
Name _____ Date _____

32 main | 2-up grid | 12 pages | visible side quests

Completion Reward

Shown here as a small pack artifact, not a preview destination.

1. If two angles are vertical angles, what can you conclude?



When two lines intersect, the opposite angles form a vertical pair and are congruent.

A. They are supplementary.
B. They are always right angles.
C. They have equal side lengths.
D. They are congruent.

1.1. In a geometry proof, the reason explains:

A. why a statement is true
B. what color to draw
C. which figure is largest
D. only the final answer

1.2. A 'given' in a proof is:

A. something you must prove
B. information stated as true to start the proof
C. a drawing style
D. the final conclusion

1.3. If two angles form a linear pair, what must be true?

A. They are complementary
B. They are supplementary
C. They are congruent
D. They are acute

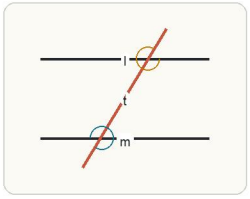
1.4. CPCTC is used after you prove:

A. a figure is similar
B. two lines are parallel
C. two triangles are congruent
D. an angle is right

1.5. Why does proof order matter?

A. Because later steps can depend on earlier ones
B. Because proofs must be alphabetical
C. Because the diagram changes
D. Because reasons come first

2. If lines l and m are parallel, what can you conclude about angles a and b in the figure?



Corresponding and alternate interior angle relationships come from the parallel-line structure, not from appearance alone.

A. They sum to 360 degrees.
B. They must both be right angles.
C. They are congruent.
D. They have equal side lengths.

2.1. In a geometry proof, the reason explains:

A. why a statement is true
B. what color to draw
C. which figure is largest
D. only the final answer

2.2. A 'given' in a proof is:

A. something you must prove
B. information stated as true to start the proof
C. a drawing style
D. the final conclusion

2.3. If two angles form a linear pair, what must be true?

A. They are complementary
B. They are supplementary
C. They are congruent
D. They are acute

2.4. CPCTC is used after you prove:

A. a figure is similar
B. two lines are parallel
C. two triangles are congruent
D. an angle is right

2.5. Why does proof order matter?

A. Because later steps can depend on earlier ones
B. Because proofs must be alphabetical
C. Because the diagram changes
D. Because reasons come first

3. What does it mean for two lines to be perpendicular?

A. They are the same length.
B. They never intersect.
C. They are both horizontal.
D. They intersect to form right angles.

3.1. In a geometry proof, the reason explains:

A. why a statement is true
B. what color to draw
C. which figure is largest
D. only the final answer

3.2. A 'given' in a proof is:

A. something you must prove
B. information stated as true to start the proof
C. a drawing style
D. the final conclusion

3.3. If two angles form a linear pair, what must be true?

A. They are complementary
B. They are supplementary
C. They are congruent
D. They are acute

3.4. CPCTC is used after you prove:

A. a figure is similar
B. two lines are parallel
C. two triangles are congruent
D. an angle is right

3.5. Why does proof order matter?

A. Because later steps can depend on earlier ones
B. Because proofs must be alphabetical
C. Because the diagram changes
D. Because reasons come first

4. What is true about a linear pair of angles?

A. They are vertical.
B. They are always congruent.
C. They are supplementary.
D. They are always acute.

4.1. In a geometry proof, the reason explains:

A. why a statement is true
B. what color to draw
C. which figure is largest
D. only the final answer

4.2. A 'given' in a proof is:

A. something you must prove
B. information stated as true to start the proof
C. a drawing style
D. the final conclusion

4.3. If two angles form a linear pair, what must be true?

A. They are complementary
B. They are supplementary
C. They are congruent
D. They are acute

4.4. CPCTC is used after you prove:

A. a figure is similar
B. two lines are parallel
C. two triangles are congruent
D. an angle is right

4.5. Why does proof order matter?

A. Because later steps can depend on earlier ones
B. Because proofs must be alphabetical
C. Because the diagram changes
D. Because reasons come first

5. In a two-column proof, where do the reasons go?

A. Left column
B. Top row only
C. Under the diagram
D. Right column

5.1. In a geometry proof, the reason explains:

A. why a statement is true
B. what color to draw
C. which figure is largest
D. only the final answer

5.2. A 'given' in a proof is:

A. something you must prove
B. information stated as true to start the proof
C. a drawing style
D. the final conclusion

5.3. If two angles form a linear pair, what must be true?

A. They are complementary
B. They are supplementary
C. They are congruent
D. They are acute

5.4. CPCTC is used after you prove:

A. a figure is similar
B. two lines are parallel
C. two triangles are congruent
D. an angle is right

5.5. Why does proof order matter?

A. Because later steps can depend on earlier ones
B. Because proofs must be alphabetical
C. Because the diagram changes
D. Because reasons come first

6. What is the converse of 'If two lines are parallel, then alternate interior angles are congruent'?

A. If the lines are not parallel, then the angles are not congruent.
B. If the angles are congruent, then the lines intersect.
C. If lines are parallel, then corresponding sides are equal.
D. If alternate interior angles are congruent, then the lines are parallel.

6.1. In a geometry proof, the reason explains:

A. why a statement is true
B. what color to draw
C. which figure is largest
D. only the final answer

6.2. A 'given' in a proof is:

A. something you must prove
B. information stated as true to start the proof
C. a drawing style
D. the final conclusion

6.3. If two angles form a linear pair, what must be true?

A. They are complementary
B. They are supplementary
C. They are congruent
D. They are acute

6.4. CPCTC is used after you prove:

A. a figure is similar
B. two lines are parallel
C. two triangles are congruent
D. an angle is right

6.5. Why does proof order matter?

A. Because later steps can depend on earlier ones
B. Because proofs must be alphabetical
C. Because the diagram changes
D. Because reasons come first

7. What does a counterexample do?

A. It shows a conjecture is false.
B. It proves a theorem true.
C. It labels the diagram.
D. It changes a definition.

7.1. In a geometry proof, the reason explains:

A. why a statement is true
B. what color to draw
C. which figure is largest
D. only the final answer

7.2. A 'given' in a proof is:

A. something you must prove
B. information stated as true to start the proof
C. a drawing style
D. the final conclusion

7.3. If two angles form a linear pair, what must be true?

A. They are complementary
B. They are supplementary
C. They are congruent
D. They are acute

7.4. CPCTC is used after you prove:

A. a figure is similar
B. two lines are parallel
C. two triangles are congruent
D. an angle is right

7.5. Why does proof order matter?

A. Because later steps can depend on earlier ones
B. Because proofs must be alphabetical
C. Because the diagram changes
D. Because reasons come first

8. In the statement 'If two lines are perpendicular, then they form right angles,' what is the hypothesis?

A. They form right angles.
B. Two lines are perpendicular.
C. The lines intersect.
D. The angles are supplementary.

8.1. In a geometry proof, the reason explains:

A. why a statement is true
B. what color to draw
C. which figure is largest
D. only the final answer

8.2. A 'given' in a proof is:

A. something you must prove
B. information stated as true to start the proof
C. a drawing style
D. the final conclusion

8.3. If two angles form a linear pair, what must be true?

A. They are complementary
B. They are supplementary
C. They are congruent
D. They are acute

8.4. CPCTC is used after you prove:

A. a figure is similar
B. two lines are parallel
C. two triangles are congruent
D. an angle is right

8.5. Why does proof order matter?

A. Because later steps can depend on earlier ones
B. Because proofs must be alphabetical
C. Because the diagram changes
D. Because reasons come first

9. In a two-column proof, which of these is usually a reason?

A. Vertical angles are congruent.
B. Angle ABC
C. Segment AB
D. Triangle DEF

9.1. In a geometry proof, the reason explains:

A. why a statement is true
B. what color to draw
C. which figure is largest
D. only the final answer

9.2. A 'given' in a proof is:

A. something you must prove
B. information stated as true to start the proof
C. a drawing style
D. the final conclusion

9.3. If two angles form a linear pair, what must be true?

A. They are complementary
B. They are supplementary
C. They are congruent
D. They are acute

9.4. CPCTC is used after you prove:

A. a figure is similar
B. two lines are parallel
C. two triangles are congruent
D. an angle is right

9.5. Why does proof order matter?

A. Because later steps can depend on earlier ones
B. Because proofs must be alphabetical
C. Because the diagram changes
D. Because reasons come first

10. In a proof, what is a given?

A. A fact that only appears in the picture
B. The final statement to prove
C. A fact provided at the start of the problem
D. A random guess about the diagram

10.1. In a geometry proof, the reason explains:

A. why a statement is true
B. what color to draw
C. which figure is largest
D. only the final answer

10.2. A 'given' in a proof is:

A. something you must prove
B. information stated as true to start the proof
C. a drawing style
D. the final conclusion

10.3. If two angles form a linear pair, what must be true?

A. They are complementary
B. They are supplementary
C. They are congruent
D. They are acute

10.4. CPCTC is used after you prove:

A. a figure is similar
B. two lines are parallel
C. two triangles are congruent
D. an angle is right

10.5. Why does proof order matter?

A. Because later steps can depend on earlier ones
B. Because proofs must be alphabetical
C. Because the diagram changes
D. Because reasons come first

11. Which is a definition rather than a theorem?

A. Vertical angles are congruent.
B. The triangle sum is 180 degrees.
C. Parallel lines cut by a transversal create corresponding angles.
D. A midpoint divides a segment into two congruent segments.

11.1. In a geometry proof, the reason explains:

A. why a statement is true
B. what color to draw
C. which figure is largest
D. only the final answer

11.2. A 'given' in a proof is:

A. something you must prove
B. information stated as true to start the proof
C. a drawing style
D. the final conclusion

11.3. If two angles form a linear pair, what must be true?

A. They are complementary
B. They are supplementary
C. They are congruent
D. They are acute

11.4. CPCTC is used after you prove:

A. a figure is similar
B. two lines are parallel
C. two triangles are congruent
D. an angle is right

11.5. Why does proof order matter?

A. Because later steps can depend on earlier ones
B. Because proofs must be alphabetical
C. Because the diagram changes
D. Because reasons come first

12. Which reason matches the statement 'Angle 1 is congruent to angle 2' when the angles are alternate interior angles formed by parallel lines?

A. Reflexive property
B. Segment addition postulate
C. Alternate interior angles theorem
D. Corresponding parts of congruent triangles are congruent

12.1. In a geometry proof, the reason explains:

A. why a statement is true
B. what color to draw
C. which figure is largest
D. only the final answer

12.2. A 'given' in a proof is:

A. something you must prove
B. information stated as true to start the proof
C. a drawing style
D. the final conclusion

12.3. If two angles form a linear pair, what must be true?

A. They are complementary
B. They are supplementary
C. They are congruent
D. They are acute

12.4. CPCTC is used after you prove:

A. a figure is similar
B. two lines are parallel
C. two triangles are congruent
D. an angle is right

12.5. Why does proof order matter?

A. Because later steps can depend on earlier ones
B. Because proofs must be alphabetical
C. Because the diagram changes
D. Because reasons come first

13. If a pair of alternate interior angles are congruent, what can you conclude?

A. The lines are perpendicular.
B. The angles must be supplementary.
C. The segments are equal in length.
D. The lines are parallel.

13.1. In a geometry proof, the reason explains:

A. why a statement is true
B. what color to draw
C. which figure is largest
D. only the final answer

13.2. A 'given' in a proof is:

A. something you must prove
B. information stated as true to start the proof
C. a drawing style
D. the final conclusion

13.3. If two angles form a linear pair, what must be true?

A. They are complementary
B. They are supplementary
C. They are congruent
D. They are acute

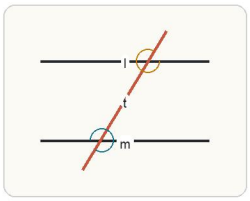
13.4. CPCTC is used after you prove:

A. a figure is similar
B. two lines are parallel
C. two triangles are congruent
D. an angle is right

13.5. Why does proof order matter?

A. Because later steps can depend on earlier ones
B. Because proofs must be alphabetical
C. Because the diagram changes
D. Because reasons come first

14. Where does the fact angle a = angle b come from in the figure?



If the marked angles come from a transversal crossing parallel lines, the justification comes from that angle relationship theorem.

A. A midpoint definition
B. Vertical angles theorem
C. Parallel lines cut by a transversal
D. Triangle angle-sum theorem

14.1. In a geometry proof, the reason explains:

A. why a statement is true
B. what color to draw
C. which figure is largest
D. only the final answer

14.2. A 'given' in a proof is:

A. something you must prove
B. information stated as true to start the proof
C. a drawing style
D. the final conclusion

14.3. If two angles form a linear pair, what must be true?

A. They are complementary
B. They are supplementary
C. They are congruent
D. They are acute

14.4. CPCTC is used after you prove:

A. a figure is similar
B. two lines are parallel
C. two triangles are congruent
D. an angle is right

14.5. Why does proof order matter?

A. Because later steps can depend on earlier ones
B. Because proofs must be alphabetical
C. Because the diagram changes
D. Because reasons come first

15. If two angles are vertical angles, what statement can you write next?

A. The angles are supplementary.
B. The angles are congruent.
C. The angles are complementary.
D. The lines are parallel.

15.1. In a geometry proof, the reason explains:

A. why a statement is true
B. what color to draw
C. which figure is largest
D. only the final answer

15.2. A 'given' in a proof is:

A. something you must prove
B. information stated as true to start the proof
C. a drawing style
D. the final conclusion

15.3. If two angles form a linear pair, what must be true?

A. They are complementary
B. They are supplementary
C. They are congruent
D. They are acute

15.4. CPCTC is used after you prove:

A. a figure is similar
B. two lines are parallel
C. two triangles are congruent
D. an angle is right

15.5. Why does proof order matter?

A. Because later steps can depend on earlier ones
B. Because proofs must be alphabetical
C. Because the diagram changes
D. Because reasons come first

16. If M is the midpoint of AB, what can you conclude?

A. Angle A equals angle B
B. AM = MB
C. AB is perpendicular to M
D. AM + MB = 1

16.1. In a geometry proof, the reason explains:

A. why a statement is true
B. what color to draw
C. which figure is largest
D. only the final answer

16.2. A 'given' in a proof is:

A. something you must prove
B. information stated as true to start the proof
C. a drawing style
D. the final conclusion

16.3. If two angles form a linear pair, what must be true?

A. They are complementary
B. They are supplementary
C. They are congruent
D. They are acute

16.4. CPCTC is used after you prove:

A. a figure is similar
B. two lines are parallel
C. two triangles are congruent
D. an angle is right

16.5. Why does proof order matter?

A. Because later steps can depend on earlier ones
B. Because proofs must be alphabetical
C. Because the diagram changes
D. Because reasons come first

17. You have already proven two sides and the included angle congruent in two triangles. What should you do next?

A. Conclude the triangles are congruent by SAS.
B. Conclude the triangles are similar by AA.
C. Use HL because two sides are known.
D. Look for another angle before any theorem can apply.

17.1. In a geometry proof, the reason explains:

A. why a statement is true
B. what color to draw
C. which figure is largest
D. only the final answer

17.2. A 'given' in a proof is:

A. something you must prove
B. information stated as true to start the proof
C. a drawing style
D. the final conclusion

17.3. If two angles form a linear pair, what must be true?

A. They are complementary
B. They are supplementary
C. They are congruent
D. They are acute

17.4. CPCTC is used after you prove:

A. a figure is similar
B. two lines are parallel
C. two triangles are congruent
D. an angle is right

17.5. Why does proof order matter?

A. Because later steps can depend on earlier ones
B. Because proofs must be alphabetical
C. Because the diagram changes
D. Because reasons come first

18. A student says two segments are equal because they look equal in the picture. What is the problem?

A. A sketch can suggest, but it does not prove, equal lengths without a given fact or theorem.
B. Pictures always prove side lengths exactly.
C. Side lengths matter only in algebra, not geometry.
D. You should never use a diagram in geometry.

18.1. In a geometry proof, the reason explains:

A. why a statement is true
B. what color to draw
C. which figure is largest
D. only the final answer

18.2. A 'given' in a proof is:

A. something you must prove
B. information stated as true to start the proof
C. a drawing style
D. the final conclusion

18.3. If two angles form a linear pair, what must be true?

A. They are complementary
B. They are supplementary
C. They are congruent
D. They are acute

18.4. CPCTC is used after you prove:

A. a figure is similar
B. two lines are parallel
C. two triangles are congruent
D. an angle is right

18.5. Why does proof order matter?

A. Because later steps can depend on earlier ones
B. Because proofs must be alphabetical
C. Because the diagram changes
D. Because reasons come first

19. A student writes 'These segments look equal, so they are congruent.' What is the flaw?

A. Equal-looking segments are always congruent.
B. Only angles can be proven from a diagram.
C. Congruence never appears in proofs.
D. A diagram can suggest ideas but is not proof by itself.

19.1. In a geometry proof, the reason explains:

A. why a statement is true
B. what color to draw
C. which figure is largest
D. only the final answer

19.2. A 'given' in a proof is:

A. something you must prove
B. information stated as true to start the proof
C. a drawing style
D. the final conclusion

19.3. If two angles form a linear pair, what must be true?

A. They are complementary
B. They are supplementary
C. They are congruent
D. They are acute

19.4. CPCTC is used after you prove:

A. a figure is similar
B. two lines are parallel
C. two triangles are congruent
D. an angle is right

19.5. Why does proof order matter?

A. Because later steps can depend on earlier ones
B. Because proofs must be alphabetical
C. Because the diagram changes
D. Because reasons come first

20. A student claims two angles are congruent just because the lines in the picture look parallel. What is missing?

A. A measurement showing the diagram is drawn neatly.
B. A given fact or proven statement that the lines are parallel.
C. A statement that the angles are vertical.
D. A translation of the whole figure.

20.1. In a geometry proof, the reason explains:

A. why a statement is true
B. what color to draw
C. which figure is largest
D. only the final answer

20.2. A 'given' in a proof is:

A. something you must prove
B. information stated as true to start the proof
C. a drawing style
D. the final conclusion

20.3. If two angles form a linear pair, what must be true?

A. They are complementary
B. They are supplementary
C. They are congruent
D. They are acute

20.4. CPCTC is used after you prove:

A. a figure is similar
B. two lines are parallel
C. two triangles are congruent
D. an angle is right

20.5. Why does proof order matter?

A. Because later steps can depend on earlier ones
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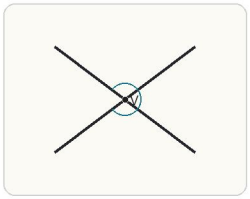
21. Vertical angles are labeled x + 15 and 3x - 25. What is x? Answer with a number.



Vertical angles are congruent, so their algebraic expressions can be set equal to solve for x.

21.1. In a geometry proof, the reason explains:

A. why a statement is true
B. what color to draw
C. which figure is largest
D. only the final answer

21.2. A 'given' in a proof is:

A. something you must prove
B. information stated as true to start the proof
C. a drawing style
D. the final conclusion

21.3. If two angles form a linear pair, what must be true?

A. They are complementary
B. They are supplementary
C. They are congruent
D. They are acute

21.4. CPCTC is used after you prove:

A. a figure is similar
B. two lines are parallel
C. two triangles are congruent
D. an angle is right

21.5. Why does proof order matter?

A. Because later steps can depend on earlier ones
B. Because proofs must be alphabetical
C. Because the diagram changes
D. Because reasons come first

22. Two angles form a linear pair. One angle is 118 degrees. What is the other angle? Answer with a number.

22.1. In a geometry proof, the reason explains:

A. why a statement is true
B. what color to draw
C. which figure is largest
D. only the final answer

22.2. A 'given' in a proof is:

A. something you must prove
B. information stated as true to start the proof
C. a drawing style
D. the final conclusion

22.3. If two angles form a linear pair, what must be true?

A. They are complementary
B. They are supplementary
C. They are congruent
D. They are acute

22.4. CPCTC is used after you prove:

A. a figure is similar
B. two lines are parallel
C. two triangles are congruent
D. an angle is right

22.5. Why does proof order matter?

A. Because later steps can depend on earlier ones
B. Because proofs must be alphabetical
C. Because the diagram changes
D. Because reasons come first

23. Student A says AC = AC because of the reflexive property. Student B says AC = AC because of the transitive property. Who is correct?

A. Student B
B. Student A
C. Both students
D. Neither student

23.1. In a geometry proof, the reason explains:

A. why a statement is true
B. what color to draw
C. which figure is largest
D. only the final answer

23.2. A 'given' in a proof is:

A. something you must prove
B. information stated as true to start the proof
C. a drawing style
D. the final conclusion

23.3. If two angles form a linear pair, what must be true?

A. They are complementary
B. They are supplementary
C. They are congruent
D. They are acute

23.4. CPCTC is used after you prove:

A. a figure is similar
B. two lines are parallel
C. two triangles are congruent
D. an angle is right

23.5. Why does proof order matter?

A. Because later steps can depend on earlier ones
B. Because proofs must be alphabetical
C. Because the diagram changes
D. Because reasons come first

24. Student A says if AB = CD and CD = EF, then AB = EF by the transitive property. Student B says the reason is the reflexive property. Who is correct?

A. Student B
B. Both students
C. Student A
D. Neither student

24.1. In a geometry proof, the reason explains:

A. why a statement is true
B. what color to draw
C. which figure is largest
D. only the final answer

24.2. A 'given' in a proof is:

A. something you must prove
B. information stated as true to start the proof
C. a drawing style
D. the final conclusion

24.3. If two angles form a linear pair, what must be true?

A. They are complementary
B. They are supplementary
C. They are congruent
D. They are acute

24.4. CPCTC is used after you prove:

A. a figure is similar
B. two lines are parallel
C. two triangles are congruent
D. an angle is right

24.5. Why does proof order matter?

A. Because later steps can depend on earlier ones
B. Because proofs must be alphabetical
C. Because the diagram changes
D. Because reasons come first

25. If M is the midpoint of AB, what is the best next statement?

If M is the midpoint of AB, then AM = MB.

A. AM is perpendicular to MB
B. Angle AMB is 90 degrees
C. AM = MB
D. AB is parallel to MB

25.1. In a geometry proof, the reason explains:

A. why a statement is true
B. what color to draw
C. which figure is largest
D. only the final answer

25.2. A 'given' in a proof is:

A. something you must prove
B. information stated as true to start the proof
C. a drawing style
D. the final conclusion

25.3. If two angles form a linear pair, what must be true?

A. They are complementary
B. They are supplementary
C. They are congruent
D. They are acute

25.4. CPCTC is used after you prove:

A. a figure is similar
B. two lines are parallel
C. two triangles are congruent
D. an angle is right

25.5. Why does proof order matter?

A. Because later steps can depend on earlier ones
B. Because proofs must be alphabetical
C. Because the diagram changes
D. Because reasons come first

26. Two triangles share side AC. Which theorem or property lets you say AC = AC?

A. Transitive property
B. Reflexive property
C. Substitution property
D. Segment addition postulate

26.1. In a geometry proof, the reason explains:

A. why a statement is true
B. what color to draw
C. which figure is largest
D. only the final answer

26.2. A 'given' in a proof is:

A. something you must prove
B. information stated as true to start the proof
C. a drawing style
D. the final conclusion

26.3. If two angles form a linear pair, what must be true?

A. They are complementary
B. They are supplementary
C. They are congruent
D. They are acute

26.4. CPCTC is used after you prove:

A. a figure is similar
B. two lines are parallel
C. two triangles are congruent
D. an angle is right

26.5. Why does proof order matter?

A. Because later steps can depend on earlier ones
B. Because proofs must be alphabetical
C. Because the diagram changes
D. Because reasons come first

27. A student says: 'If lines are parallel, corresponding angles are congruent. These angles are congruent, so the lines must be parallel.' What is the issue?

A. Congruent angles can never appear in geometry.
B. The original statement means the lines are perpendicular.
C. The problem is that the angles should be supplementary instead.
D. They used the converse without proving its conditions.

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28. Angles in a linear pair measure 2x + 10 and x + 20. What is x? Answer with a number.

28.1. In a geometry proof, the reason explains:

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29. Two supplementary angles measure x + 20 and 3x. What is x? Answer with a number.

29.1. In a geometry proof, the reason explains:

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29.2. A 'given' in a proof is:

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30. A linear pair has angle measures 2x + 10 and x + 20. What is x? Answer with a number.

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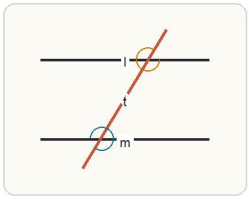
31. Which proof line is justified correctly?



Corresponding and alternate interior angles come from the parallel structure, not from the picture looking equal.

A. If lines are parallel, alternate interior angles are congruent.
B. If two angles look equal, they must be congruent.
C. If one segment is longer, it is the hypotenuse.
D. If two points are labeled, they determine a midpoint.

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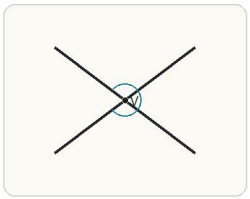
32. You know two lines intersect. Which next step is the most useful if you need congruent angles?



Vertical angles are opposite angles formed by two intersecting lines.

A. Assume the lines are the same length.
B. Identify a pair of vertical angles.
C. Guess that the angles are complementary.
D. Redraw the figure larger.

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