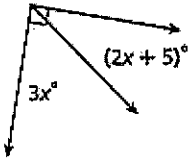


Extra Practice for Chapter 2 Test – OPTIONAL

1. A statement you can prove and then use as a reason in later proofs is a(n) _____.
2. _____ is the process of using logic to draw a conclusion from given facts, definitions, and properties.
3. A(n) _____ is a case in which a conjecture is not true.
4. A statement that you believe to be true based on inductive reasoning is called a(n) _____.
5. Find the value of the variable.



6. Find the next item in each pattern:
 - a. 405, 135, 45, 15, _____
 - b. 3, 7, 11, 15, _____
 - c. -3, 6, -12, 24, _____
7. Determine if the conditional is true. If false, give a counterexample.
“If two lines intersect, then they form four right angles.”
8. Use the conditional “If you live in the United States, then you live in Kentucky” to write the following:
Converse:

Inverse:

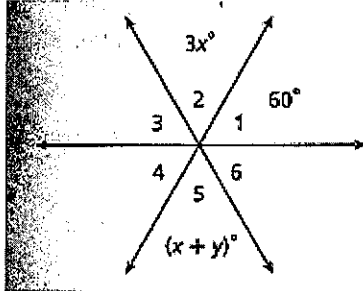
Contrapositive:
9. Solve the equation. Write a justification for each step.

$$38 = -3w + 2$$

10. Identify the property that justifies each statement.

- a. If $2x = y$ and $y = 7$, then $2x = 7$.
- b. $m\angle DEF = m\angle DEF$
- c. $\angle X \cong \angle P$, and $\angle P \cong \angle D$. So, $\angle X \cong \angle D$
- d. If $\overline{ST} \cong \overline{XY}$, then $\overline{XY} \cong \overline{ST}$.

11. In the figure below, $m\angle 1 = m\angle 2$. What is the value of y ?



12. What is the contrapositive of the statement “If it is raining, then the football team will win”?

13. What is the inverse of the statement “If a polygon has 8 sides, then it is an octagon”?

14. Which statement is true by the Symmetric Property of Congruence?

- (A) $\overline{ST} \cong \overline{ST}$
- (B) $15 + MN = MN + 15$
- (C) If $\angle P \cong \angle Q$, then $\angle Q \cong \angle P$.
- (D) If $\angle D \cong \angle E$ and $\angle E \cong \angle F$, then $\angle D \cong \angle F$.

15. Solve the equation $2(AB) + 16 = 24$ to find the length of segment AB. Write a justification for each step.

16. Determine the statement you can make using the Law of Detachment, if possible.

If a student is in tenth grade, then the student may participate in student council. Eric is a tenth grader.

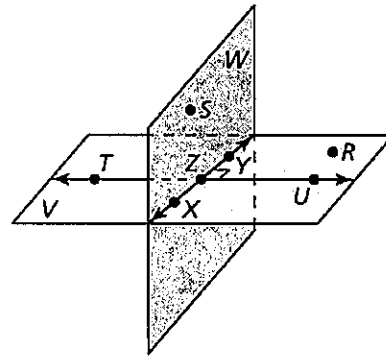
17. Determine the statement you can make using the Law of Syllogism, if possible.

If a triangle is isosceles, then it has two congruent sides. If a triangle has two congruent angles, then it has two congruent sides.

18. For the conditional “If a triangle is scalene, then its sides have different lengths,” write the converse and the biconditional.

19. Use the diagram to determine whether you can assume the statement.

- a. Planes W and V intersect at $\overleftrightarrow{TU}$
- b. Points T, R, and U are coplanar
- c. $\angle TZX$ and $\angle UZY$ are vertical angles
- d. $\overleftrightarrow{TU}$ lies in plane W



20. Decide whether inductive reasoning or deductive reasoning is used to reach the conclusion.

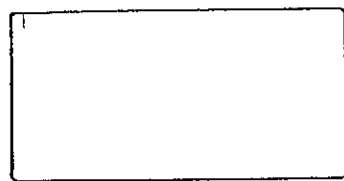
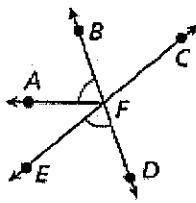
- a. All mammals have hair. Cats are mammals. So, cats have hair.
- b. Each time you do to school you walk. You went to school today, so you walked.

21. The formula for the volume V of a triangular prism is given by the equation $V = \frac{1}{2}bhl$, where b is the base of the triangle, h is the height of the triangle, and l is the length of the prism. Solve the formula for b . Then use the equation to find the base of a prism with volume 128 m^3 , height 8m , and length 4m .

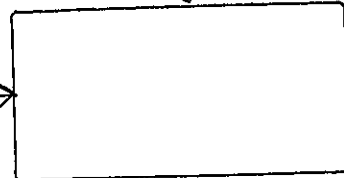
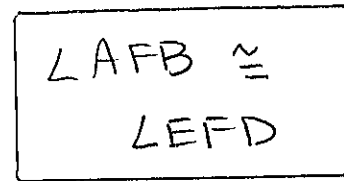
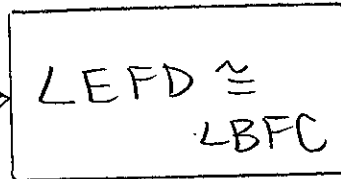
22. Complete the flow chart proof.

Given: $\angle AFB \cong \angle EFD$

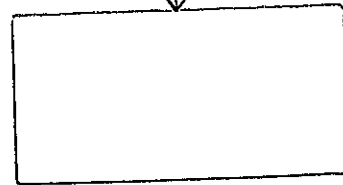
Prove: $\overrightarrow{FB}$ bisects $\angle AFC$



given
(diagram)



transitive
prop. $\cong$

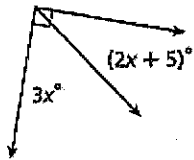


2 $\cong$ adjacent
angles $\rightarrow$ common
ray
is
 $\angle$
bisector

(def. of an $\angle$
bisector)

Extra Practice for Chapter 2 Test – OPTIONAL

1. A statement you can prove and then use as a reason in later proofs is a(n) theorem.
2. Deductive Reasoning is the process of using logic to draw a conclusion from given facts, definitions, and properties.
3. A(n) counterexample is a case in which a conjecture is not true.
4. A statement that you believe to be true based on inductive reasoning is called a(n) conjecture.
5. Find the value of the variable.



$$\begin{aligned}
 3x + 2x + 5 &= 90 \\
 5x &= 85 \\
 \boxed{x = 17}
 \end{aligned}$$

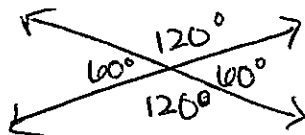
6. Find the next item in each pattern:

a. 405, 135, 45, 15, 5

b. 3, 7, 11, 15, 19

c. -3, 6, -12, 24, -48

7. Determine if the conditional is true. If false, give a counterexample.
 "If two lines intersect, then they form four right angles."



8. Use the conditional "If you live in the United States, then you live in Kentucky" to write the following:

Converse: If you live in Kentucky, then you live in the United States.

Inverse: If you do not live in the United States, then you do not live in Kentucky.

Contrapositive: If you do not live in Kentucky, then you do not live in the United States

9. Solve the equation. Write a justification for each step.

$$38 = -3w + 2 \quad \text{given equation}$$

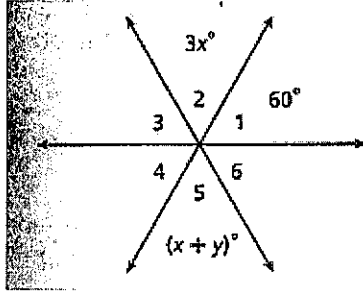
$$36 = -3w \quad \text{subtraction prop. =}$$

$$-12 = w \quad \text{division prop. =}$$

10. Identify the property that justifies each statement.

- a. If $2x = y$ and $y = 7$, then $2x = 7$. transitive prop. = (or substitution prop. =)
- b. $m\angle DEF = m\angle DEF$ reflexive prop. =
- c. $\angle X \cong \angle P$, and $\angle P \cong \angle D$. So, $\angle X \cong \angle D$ transitive prop. $\cong$
- d. If $\overline{ST} \cong \overline{XY}$, then $\overline{XY} \cong \overline{ST}$. symmetric prop. $\cong$

11. In the figure below, $m\angle 1 = m\angle 2$. What is the value of y ?



$$60 = 3x$$

$$\boxed{20 = x}$$

$$m\angle 2 = m\angle 5 \quad \text{(vertical } \angle \text{s are } \cong \text{)}$$

$$m\angle 5 = m\angle 1 \quad \text{(transitive prop. =)}$$

$$x + y = 60$$

$$20 + y = 60 \rightarrow \boxed{y = 40}$$

12. What is the contrapositive of the statement "If it is raining, then the football team will win"?

If the football team does not win, then it is not raining.

13. What is the inverse of the statement "If a polygon has 8 sides, then it is an octagon"?

If a polygon does not have 8 sides, then it is not an octagon.

14. Which statement is true by the Symmetric Property of Congruence?

(A) $\overline{ST} \cong \overline{ST}$

(B) $15 + MN = MN + 15$

(C) If $\angle P \cong \angle Q$, then $\angle Q \cong \angle P$.

(D) If $\angle D \cong \angle E$ and $\angle E \cong \angle F$, then $\angle D \cong \angle F$.

15. Solve the equation $2(AB) + 16 = 24$ to find the length of segment AB. Write a justification for each step.

$$2(AB) + 16 = 24$$

given equation

$$2(AB) = 8$$

subtraction prop. =

$$AB = 4$$

division prop. =

16. Determine the statement you can make using the Law of Detachment, if possible.

If a student is in tenth grade, then the student may participate in student council. Eric is a tenth grader.

Eric may participate in student council.

17. Determine the statement you can make using the Law of Syllogism, if possible.

If a triangle is isosceles, then it has two congruent sides. If a triangle has two congruent angles, then it has two congruent sides.

Not possible (one statement's conclusion is not the other's hypothesis)

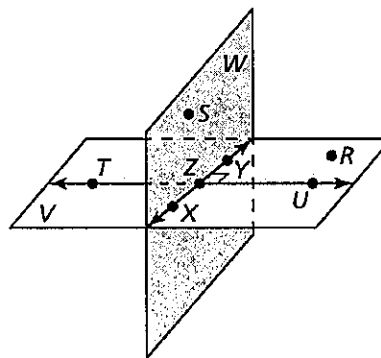
18. For the conditional "If a triangle is scalene, then its sides have different lengths," write the converse and the biconditional.

Converse: If a triangle's sides have different lengths, then it is scalene.

Biconditional: A triangle is scalene if and only if its sides have different lengths.

19. Use the diagram to determine whether you can assume the statement.

- Planes W and V intersect at $\overleftrightarrow{TU}$ NO
- Points T, R, and U are coplanar YES
- $\angle TZX$ and $\angle UZY$ are vertical angles YES
- $\overleftrightarrow{TU}$ lies in plane W NO



20. Decide whether inductive reasoning or deductive reasoning is used to reach the conclusion.

- All mammals have hair. Cats are mammals. So, cats have hair. deductive
- Each time you go to school you walk. You went to school today, so you walked. inductive

21. The formula for the volume V of a triangular prism is given by the equation $V = \frac{1}{2}bhl$, where b is the base of the triangle, h is the height of the triangle, and l is the length of the prism. Solve the formula for b . Then use the equation to find the base of a prism with volume 128 m^3 , height 8m , and length 4m .

$$V = \frac{1}{2}bhl$$

$$2V = bhl$$

$$\frac{2V}{hl} = b$$

$$b = \frac{2(128)}{(8)(4)}$$

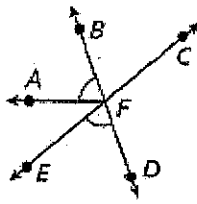
$$b = 8$$

base is
8m long

22. Complete the flow chart proof.

Given: $\angle AFB \cong \angle EFD$

Prove: $\overrightarrow{FB}$ bisects $\angle AFC$



$\angle EFD$ and $\angle BFC$ are vertical angles

given (diagram)

$\angle EFD \cong \angle BFC$

vertical $\angle$ s are $\cong$

$\angle AFB \cong \angle BFC$

transitive prop. $\cong$

$\overrightarrow{FB}$ bisects $\angle AFC$

$\angle \cong$ adjacent angles $\rightarrow$ common ray is $\angle$ bisector

(def. of an $\angle$ bisector)