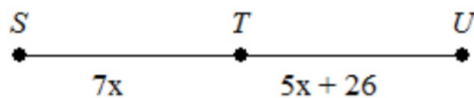


- 1.) If T is the midpoint of SU , find the values of x and ST . The diagram is not to scale.

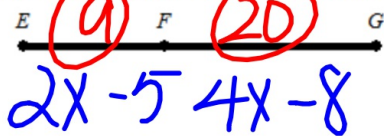


$$7x = 5x + 26$$

$$2x = 26$$

$$x = 13$$

- 2.) If $EF = 2x - 5$, $FG = 4x - 8$, and $EG = 29$, find the values of x , EF , and FG . The drawing is not to scale.



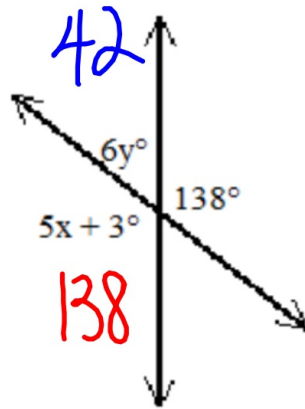
$$2x - 5 + 4x - 8 = 29$$

$$6x - 13 = 29$$

$$6x = 42$$

$$x = 7$$

3.) Find the values of x and y .



Drawing not to scale

$$5x + 3 = 138$$

$$5x = 135$$

$$x = 27$$

$$6y + 138 = 180$$

$$6y = 42$$

$$y = 7$$

4.) Two lines are parallel iff they don't intersect.

Write the two conditionals that form this biconditional.

1. If two lines don't intersect, then they are \parallel .
2. If lines are \parallel , then they don't intersect.

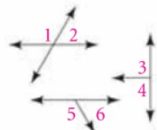
HW #9 Answers

1. If two segments are congruent, then they have the same length. It is true. Two segments have the same length if and only if they are congruent.
4. If $|x| = 3$, then $x = 3$. It is false since $|-3| = 3$ also.
11. If two angles are congruent, then they have the same measure. If two angles have the same measure, then they are congruent.
16. not reversible
17. A point is a midpoint of a segment if and only if it divides the segment into two congruent segments.
20. No; it is not precise; a ray or pt. could be part of a line.
27. Answers may vary. Sample: Two angles are a linear pair if and only if they are adjacent and supplementary.

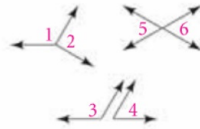
28. No; angle 1 and angle 2 are not suppl.
29. Yes; angle 1 and angle 2 share a side and a vertex, and are suppl.
30. No; angle 1 and angle 2 do not share a vertex.
31. No; angle 1 and angle 2 do not share a side, and are not suppl.
38. Angles are congruent if and only if they have equal measure.



27. **Writing** Use the figures below to write a good definition of *linear pair*.



Linear pairs



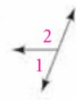
Not linear pairs

Do angles 1 and 2 form a linear pair? Explain. (*Hint: See Exercise 27.*)

28.



29.



30.



31.



Write each statement as a biconditional.

38. Congruent angles are angles with equal measure.

Each conditional statement below is true. Write it as a true, combine the statements as a biconditional.

1. If two segments have the same length, then they are congruent.
2. **Algebra** If $x = 12$, then $2x - 5 = 19$.
3. If a number is divisible by 20, then it is even.

Test each statement below to see if it is reversible. If not, write *not reversible*.

13. A perpendicular bisector of a segment is a line perpendicular to a segment at its midpoint.
14. Parallel planes are planes that do not intersect.
15. A Tarheel is a person who was born in North Carolina.
16. A rectangle is a four-sided figure with at least one right angle.
17. A midpoint of a segment is a point that divides the segment into two congruent segments.

Is each statement below a good definition? If not, explain.

18. A cat is an animal with whiskers.
19. A dog is a good pet.
20. A segment is part of a line.
21. Parallel lines do not intersect.

Good Definitions:

- ☐ clearly understood
- ☐ precise
- ☐ makes a true biconditional

Objective 2: I can identify good definitions by using biconditionals.

Example 4:

A. Is this a good definition of Parallel Lines?

Two lines are parallel iff they don't intersect.

Write the two conditionals that form this biconditional.

1.

False; because
there can

2.

be skew lines.

Are they
both true?

B. Is this a good definition of a square?

A figure is a square iff it has four right angles.

Write the two conditionals that form this biconditional.

1.

if a figure is a square, then it has
4 right \angle 's.

2.

if a figure has 4 r.t. angles, then
its a square.

false (2)
it can be
a rect.

Write a good definition of a square as a biconditional.

A figure is a square if and only if... it has 4 \cong sides & 4 RT
L's

Is this biconditional true?

It's July if and only if it's Summer time.

Write the two conditionals that make up this biconditional

If it's July, then it's Summer time

If it's Summer time, then it's July
False, it could be Aug

If an angle is obtuse, then its measure is greater than 90 degrees.

1. Write the converse.

If an \angle measure is > 90 , then the angle is obtuse

2. Use the conditional and its converse to write a biconditional.

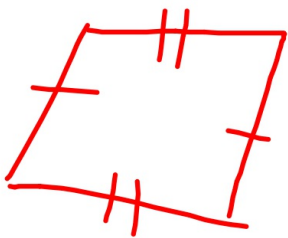
The angle is obtuse iff its measure is greater than 90.

3. Is the biconditional true?

false. Straight \angle 's.

Is this biconditional true?

A figure is a rectangle iff its opposite sides are congruent.



Rect \rightarrow opp sides are \cong .

opp sides \rightarrow Rect.

false
b/c.

parallelogram

1. $\frac{4}{x} = \frac{15}{21}$

$$15x = 84$$

$$x = 5.6$$

2. $9 - 3(x + 4) = -21$

$$9 - 3x - 12 = -21$$

$$-3x - 3 = -21$$

$$-3x = -18$$

$$x = 6$$

3. $\frac{x+6}{3} - 1 = -21$

$$\frac{x+6}{3} = -20$$

$$x+6 = -60$$

$$x = -66$$

4. $3 - \frac{4}{7}m = -9$

$$\begin{array}{r} -3 \quad -3 \\ \hline \end{array}$$

$$-\frac{4}{7}m = -12$$

$$m = 21$$

5. $5Q = 2Q - 24$

$$3Q = -24$$

$$Q = -8$$

In geometry you accept postulates and properties as true. You use deductive reasoning to prove other statements. Some of the properties that you accept as true are the properties of equality from algebra. They are listed below in terms of any numbers a , b , and c .



Key Concepts

Summary

Properties of Equality

Addition Property	If $a = b$, then $a + c = b + c$.
Subtraction Property	If $a = b$, then $a - c = b - c$.
Multiplication Property	If $a = b$, then $a \cdot c = b \cdot c$.
Division Property	If $a = b$ and $c \neq 0$, then $\frac{a}{c} = \frac{b}{c}$.
Reflexive Property	$a = a$
Symmetric Property	If $a = b$, then $b = a$.
Transitive Property	If $a = b$ and $b = c$, then $a = c$.
Substitution Property	If $a = b$, then b can replace a in any expression.

You also assume that other properties from algebra are true.



Key Concepts

Property

The Distributive Property

$$a(b + c) = ab + ac$$

Solve this equation. Justify the steps.

$$5x + 3 = -12$$

Steps

$$\begin{aligned} 5x + 3 &= -12 \\ 5x + 3 - 3 &= -12 - 3 \\ 5x &= -15 \\ \frac{5x}{5} &= \frac{-15}{5} \\ x &= -3 \end{aligned}$$

Reasons

Given
Subt. prop of
Simplify
÷ prop of eq.
Simplify

Solve this equation. Justify the steps.

$$6 + 2(3x + 1) = 38$$

Steps

$$\begin{aligned} 6 + 2(3x + 1) &= 38 \\ 6 + 2(3x + 1) &= 38 \\ -6 & \\ 2(3x + 1) &= 32 \\ 6x + 2 &= 32 \end{aligned}$$

Reasons

Given
Subt. prop
of eq.
Simplify
Distribute

Classwork: Practice 2-2 Worksheet

skip #13-15

IXL #4 - B.8 & I.1 (I not an L) due Friday, Sept. 28th!