

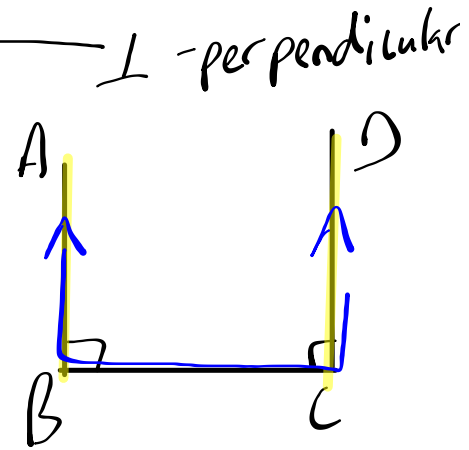
HOMWORK QUESTIONS...

8. a) Joshua made the following conjecture: "If $AB \perp BC$ and $BC \perp CD$, then $AB \perp CD$." Identify the error in his reasoning.

Joshua's Proof

Statement	Justification
$AB \perp BC$	Given
$BC \perp CD$	Given
$AB \perp CD$	Transitive property

Error



b) Make a correct conjecture about perpendicular lines.

$$\angle ABC + \angle BCD = 180^\circ$$

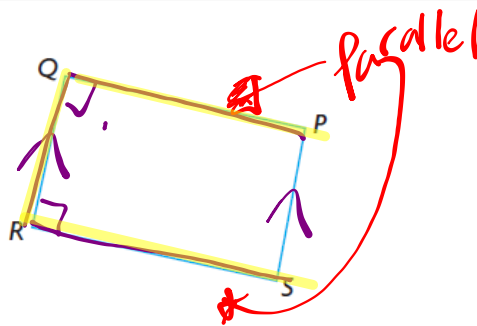
$$\therefore AB \parallel CD$$

Added CIA

10. Jason wrote the following proof.
Identify his errors, and correct his proof.

Given: $QP \perp QR$
 $QR \perp RS$
 $QR \parallel PS$

Prove: $QPSR$ is a parallelogram.



Jason's Proof

Statement	Justification
$\angle PQR = 90^\circ$ and $\angle QRS = 90^\circ$	Lines that are perpendicular meet at right angles.
$QP \parallel RS$	Since the interior angles on the same side of a transversal are equal, QP and RS are parallel.
$QR \parallel PS$ $QPSR$ is a parallelogram	Given $QPSR$ has two pairs of parallel sides.

Handwritten red notes:
- A checkmark is next to the first justification.
- The word "equal" in the second justification is circled in yellow, with an arrow pointing to it from the word "error".
- The word "Supplementary" is written in red, with an arrow pointing to the word "equal" in the second justification, indicating that the angles are supplementary, not equal.

12. Given: $\triangle FOX$ is isosceles.

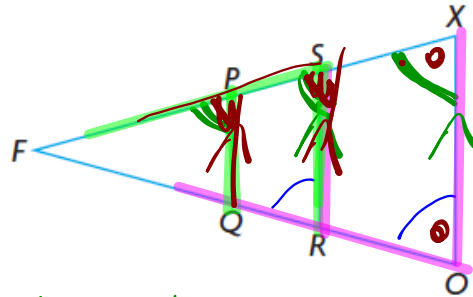
$$\angle FOX = \angle FRS$$

$$\angle FXO = \angle FPQ$$

Prove: $PQ \parallel SR$ and $SR \parallel XO$

a)

b)



Statement	Justification
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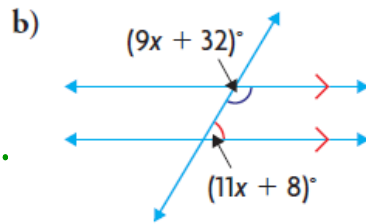
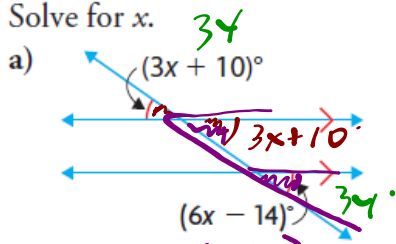
$\angle FRS = \angle FOX$	Given
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$\therefore SR \parallel XO$	CA
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S	J
$\angle FPQ = \angle FXO$	Given
$\angle FRS = \angle FOX$	Given
$\angle FSR = \angle FXO$	CA

$\angle FPQ = \angle FSR$	Transitive
$\therefore PQ \parallel SR$	CA

20. Solve for x.



(CA)

$$6x - 14 = 3x + 10$$

$$6x - 3x = 10 + 14$$

$$\frac{3x}{3} = \frac{24}{3}$$

$$x = 8$$

p. 77

EXAMPLE 3

Using angle properties to prove that lines are parallel

One side of a cellphone tower will be built as shown. Use the angle measures to prove that braces CG , BF , and AE are parallel.

S | J

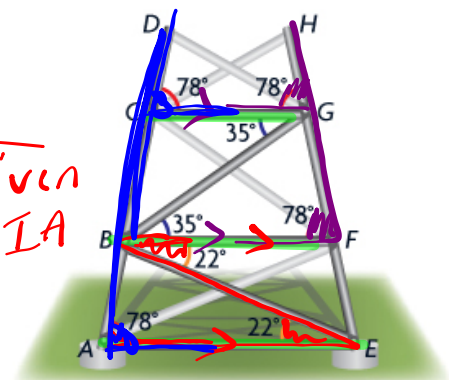
$\angle HGC = \angle GFG$ Given

$\therefore CG \parallel BF$ CA

S | J

$\angle FBE = \angle BEA$ Given

$\therefore BF \parallel AE$ AIA



Morteza's Solution: Using corresponding angles

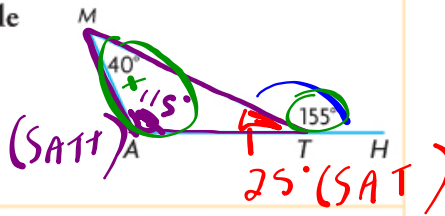
- $\angle BAE = 78^\circ$ and $\angle DCG = 78^\circ$ ----- Given
- $AE \parallel CG$ ----- When corresponding angles are equal, the lines are parallel.
- $\angle CGH = 78^\circ$ and $\angle BFG = 78^\circ$ ----- Given
- $CG \parallel BF$ ----- When corresponding angles are equal, the lines are parallel.
- $AE \parallel CG$ and $CG \parallel BF$ ----- Since AE and BF are both parallel to CG , all three lines are parallel to each other.

The three braces are parallel.

APPLY the Math

EXAMPLE 1 Using angle sums to determine angle measures

In the diagram, $\angle MTH$ is an **exterior angle** of $\triangle MAT$. Determine the measures of the unknown angles in $\triangle MAT$.



Serge's Solution

$$\begin{aligned} \angle MTA + \angle MTH &= 180^\circ \\ \angle MTA + (155^\circ) &= 180^\circ \\ \angle MTA &= 25^\circ \end{aligned}$$

$\angle MTA$ and $\angle MTH$ are supplementary since they form a straight line.

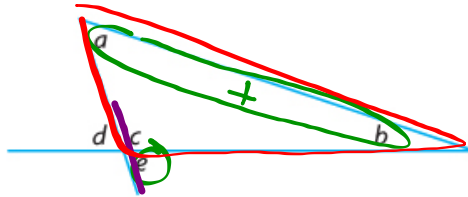
$$\begin{aligned} \angle MAT + \angle AMT + \angle MTA &= 180^\circ \\ \angle MAT + (40^\circ) + (25^\circ) &= 180^\circ \\ \angle MAT &= 115^\circ \end{aligned}$$

The sum of the measures of the interior angles of any triangle is 180° .

The measures of the unknown angles are:
 $\angle MTA = 25^\circ$; $\angle MAT = 115^\circ$.

Your Turn

Prove: $\angle e = \angle a + \angle b$



Answer



Statement	Justification
$\angle c + \angle e = 180^\circ$	S A T
$\angle a + \angle b + \angle c = 180^\circ$	S A T T
$\angle e = \angle a + \angle b$	Transitive Algebra
$\therefore \angle e = \angle a + \angle b$	

p. 90: #3, 5, 7, 9, 13 [from today's lesson]

HW:

Angle Properties



Attachments

2s3e2 finalt.mp4